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Taxonomic Study of the Cicadellinae (Homoptera: Cicadellidae) Part 1 Proconiini

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FRANK A. TAYLOR
Director, United States National Museum

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Taxonomic Study of the Cicadellinae

Part 1 Proconiini

INTRODUCTION

NEED FOR A GENERIC REVISION of the Cicadellinae became obvious to me during the more than seven years I worked at the U.S. National Museum on the staff of the Division of Insect Identification, U.S. Department of Agriculture. Specimens of cicadellines sent in from all over the world, but especially from the Neotropical region, could rarely be identified to genus on the basis of existing literature. Even when it was possible to identify a species, it was often impossible to apply a generic name which would not form a new combination. This raised the possibility of all sorts of new combinations being published in obscure journals normally not consulted by systematists, without their respective authors knowing they were new combinations, and with consequent difficulties to cataloguers.

In 1952, a preliminary investigation revealed that the male genitalia offered characters of generic worth in most cicadelline genera and of specific value in many of the genera. To undertake such a large reclassification then would have been impossible in view of the pressing demands on my time for routine identifications. A small beginning was made, however, and a study of the genus *Draeculacephala* Ball and a synopsis of the North American species of *Homalodisca* Stål were published.

In 1957 I moved to North Carolina, where more research time became available and where, through the generosity of officials of North Carolina State University at Raleigh and through a National Science Foundation grant, it became possible to study in Europe for one year (1962–63). During that time, most of the types of Cicadellinae were studied in museums in Germany, Austria, Czechoslovakia, Hungary, Poland, Denmark, Sweden, Belgium, France, and England. Lectotypes were designated by me in a series of papers, one of which is still in press, with the statement that diagnostic characters would be illustrated in a generic classification to be published later. Many of the illustrations of the proconiine lectotypes are published herein. The diagnostic characters of lectotypes of species not mentioned in the text agree with the illustrations published here, most of which were made before the lectotypes were examined. Where problems of

identity still exist, these are noted in the text. If a nominal species is listed in synonymy in this work, and the senior synonym is illustrated here, it is then considered that the lectotype of the junior synonym has been sufficiently characterized.

The Germar collection, it should be noted, was not found in Europe and efforts on the part of European colleagues failed to reveal its location. Perhaps it has been destroyed. In the collection of the Zoologische Institut und Museum in Hamburg are a number of specimens from the Heyer collection, from Lüneburg, which appear to be topotypic—a number of them labeled "Wahrscheinlich Kotype," apparently from the Germar collection. These should be given careful consideration as neotypes if it can finally be concluded that the Germar collection no longer exists. Also, the Spinola collection in Italy was not studied.

The present work was originally intended to be a classification of genera. It soon became apparent to me, however, that enough type material would be available to enable me to present synopses of species in a number of the genera studied, and these have therefore been included. Genera in this work without keys to species are those in which a great amount of variation occurs in characters usually of specific value. Also, keys have not been prepared for species of those genera which have been revised recently or which are known to be presently undergoing revision by other authors. Appropriate references to such revisions are to be found in the systematic portion of the paper.

In addition to a reclassification of the genera and a key to species whenever possible, the meager biological information available concerning the included species is given.

The study includes specimens from almost all of the major collections of the world. Many of the specimens available bear a minimum of collection data, and the distributional records and host-plant data leave much to be desired. A second physical limitation is the wide dispersal of type specimens. This has resulted in relegating to synonymy a number of species, without an actual comparison of their types, on the basis of drawings of specific characters. The specific synonymy is severe in those genera where much variation occurs and where interspecific lines are difficult to draw. A third and very serious limitation has been scarcity of material. Although thousands of specimens have been studied, the duplication of collecting localities has been quite large, probably a result of the difficulty of access to many localities and of the lack of good accommodations in them. I have been able to collect for only a three-month period in Peru to augment available collections.

An effort has been made to indicate in the checklists those species of which types have not been studied and those known from female specimens only.

In the relatively few cases where lectotypes are selected, labels on the specimens are quoted line for line, with each line separated by a slash (/), and the individual labels separated by the word "and."

With few exceptions, complete bibliographic citations are not included in the present work. Instead, the author's name is followed by a code citation consisting of the year and a letter, usually followed by a page number. These code citations refer to Metcalf's "General Catalogue of the Homoptera," Fascicle VI, "Cicadelloidea: Bibliography of the Cicadelloidea (Homoptera: Auchenorhyncha)" published in March 1964 by the Agricultural Research Service, U.S. Department of Agriculture. The code numbers of this Catalogue are the same as, but more inclusive than, Metcalf's "Bibliography of the Homoptera Auchenorhyncha," vol. 1 (1942), published in 1944, by the North Carolina State College of Agriculture and Engineering, University of North Carolina. The terminal bibliographic section of the present work includes only those papers not included in the 1964 bibliography.

Unless stated otherwise, all the new names and names of new taxa proposed in this paper are to be considered arbitrary combinations of letters. For the new genera, it is the author's intent that the nominal species cited be accepted as type-species. Paratypes were not selected for the new species.

When problems arose as to localities, the works consulted were the Reader's Digest "Great World Atlas" (1963), Bartholomew's "The Citizen's Atlas of the World" (Edinburgh, 1952), maps and indices of the National Geographic Society (Washington, D.C.), "Index to Map of Hispanic America" (American Geographical Society, N.Y., 1945), and for pertinent localities, "A Gazeteer of Entomological Stations in Ecuador" (F. Martin Brown, Ann. Ent. Soc. Amer. 34:809–851, 1941).

A number of the type specimens of new species described here are deposited in the U.S. National Museum. Numbers and entries in the USNM Type Catalogue are not included here, because the types of species of Cicadellidae are arranged alphabetically by authors and thereunder alphabetically by trivial name in a segregated type collection in the U.S. National Museum. Easy access to the types and to their label information is thus provided.

Because of space and time considerations, there has been no effort to keep an inventory of the institutional source of all the specimens examined. Also for want of time, misidentifications in the literature have not been corrected. Many of the localities previously reported for some of the species are based on misidentifications. The geographic range

indicated in the checklists include only those localities from which I have seen accurately identified specimens.

ACKNOWLEDGMENTS.—The progress of this work has been aided by so many people that apologies undoubtedly will be in order to some not mentioned here. I have tried to avoid omissions of professional entomologists but undoubtedly there are some. I have not attempted to list the legion of splendid nonprofessional people who have helped in so many ways, especially during the year when I was a foreigner in the many countries I visited in Europe.

First, much credit must go to the National Science Foundation, whose assistance was essential. Second, I am no less indebted to North Carolina State University for financial support, for making research time available, and for patience during the time necessary for the preparation of this manuscript.

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Dr. George Wallace, Carnegie Museum, Pittsburgh (CM).
Dr. A. Willink, Instituto Miguel Lillo, Tucumán, Argentina (IML).

The abbreviations below are those used later in this work in referring to the respective institutions of the persons named.

AMNH	American Museum of Natural History (Dr. Jerome Rozen).
BM	British Museum (Natural History) (Dr. W. E. China, Mr. R. J. Izzard, Dr. W. J. Knight).
BPBM	Bernice P. Bishop Museum, Hawaii (Dr. J. Linsley Gressit).
CAS	California Academy of Sciences (Dr. E. S. Ross).
CM	Carnegie Museum, Pittsburgh (Dr. George Wallace).
CNC	Canadian National Collection, Ottawa (Dr. Leonard A. Kelton).

DEI Deutsches Entomologisches Institut, East Berlin (Dr. Günther Petersen).

HNHM Magyar Nemzeti Múzeum, Budapest (Hungarian Natural History Museum, Dr. Árpád Soós).

HS Dr. J. O. Hüsing, Martin Luther Universität, Halle, Wittenberg, East Germany (Dr. Hüsing).

HU Institut für Spezielle Zoologie und Zoologisches Museum der Humboldt-Universität, East Berlin (Dr. K. K. Günther).

IML Instituto Miguel Lillo, Tucumán, Argentina (Dr. A. Willink).

INHS Illinois Natural History Survey (Dr. H. H. Ross).

IRB Institute Royal des Sciences Naturelles, Brussels (Dr. H. J. Synave).

IRSM Institut de Recherches Scientifiques à Madagascar (Dr. P. Malzy).

IZP Polska Akademia Nauk, Instytut Zoologiczny, Warsaw (Dr. Janusz Nast).

KU University of Kansas, Lawrence (Dr. George W. Byers).

MCZ Museum of Comparative Zoology, Harvard College (Dr. P. J. Darlington).

MHNP Museum National d'Histoire Naturelle, Paris (M. Roland Bénard).

MMB Moravské Museum, Brno Czechoslovakia (Mr. P. Lauterer, Dr. Jaroslav Stehlík).

NCS North Carolina State University at Raleigh.

NMV Naturhistorisches Museum, Vienna (Dr. Max Beier).

OSU Ohio State University, Columbus (Dr. Paul Freytag).

RD Mr. Robert Dreisbach, Midland, Michigan.

RFC Rockefeller Foundation, Medellín, Colombia (Dr. Robert F. Ruppel).

RFM Rockefeller Foundation, Mexico, D. F., Mexico (Dr. Douglas Barnes).

RMS Naturhistoriska Riksmuseet, Stockholm (Dr. Lars Brundin, Dr. Erik Kjellander).

SMT Staatliches Museum für Tierkunde, Dresden (Dr. Rolf Hertel).

SNGF Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt-am-Main (Dr. Heinz Schröder).

SPBF State Plant Board of Florida, Gainesville (Mr. Frank W. Mead).

SSM Zoologische Sammlung des Bayerischen Staats, Munich (Dr. Walter Forster, Dr. Heinz Freude).

USNM United States National Museum, Washington (Dr. J. P. Kramer).

UCAL University of California, Berkeley (Dr. Jerry Powell).

ZIL Zoological Institute, University of Lund, Sweden (Dr. C. H. Lindroth).

ZIMH Zoologisches Institut und Museum, Hamburg (Dr. Wilhelm Wagner, Dr. Herbert Weidner).

Systematics

Most of the work published on the classification of the Cicadellinae has appeared in a large series of short publications by numerous authors. It is not proposed to give an account of the less important of these in this section; they are referred to in the body of this paper in relation to the taxa with which they deal.

The first effort toward a synthesis of the cicadelline species was that of Signoret (1853a-c, 1854a-d, and 1855a-d), who published redescriptions of a number of species and descriptions of a large number of new species. These were illustrated in color, but the treatment was scarcely taxonomic, and all the species were placed in the genus *Tettigonia*. I have seen several copies of this work, and find the quality of reproduction of the colored plates variable among them.

Stål (1869a) published a work dealing with the genera now included in this subfamily; in it he described a number of new genera. Fowler, in his series of papers in "Biologia Centrali Americana" (1898a through 1900d), made an effort to place the Central American species in genera. Fowler's work, like that of Signoret earlier, was illustrated in color, and the same inconsistency of color reproduction noted in Signoret's work applies to that of Fowler. Ball (1901b) treated the North American species, and Distant (1908g and 1918b) treated a number of species from the Oriental region.

Melichar (1924a, 1925a, 1926a, 1932a, and 1951a) has made the only effort since Signoret at a comprehensive classification of the subfamily. The work was done without study of the male genitalia, although the taxonomic value of these structures had already been demonstrated (Lawson, 1920a) at least four years before the time the first part of his work was published. Melichar divided the subfamily into two sections, Proconiaria and Cicadellaria, corresponding fairly closely with the tribes Proconiini and Cicadellini as they are treated here (exceptions are noted in the present treatment of the lower taxa). He placed 54 genera in the Proconiaria and included 101 genera in his key to the Cicadellaria. His text treated the species of all the proconiine genera and of 16 cicadelline genera. Melichar died in September 1924 but left some manuscript notes for the remaining genera. A single part of this work, bringing to 18 the number of genera of "Cicadellaria" treated by his text, was published in Melichar's name (1951a) under the direction of Dr. V. Székessy of the Magyar Nemzeti Múzeum, Budapest.

Melichar's work was entirely without illustrations but the new genera he included in his key to the Cicadellaria (1926a:340–345) are here

considered to have been validly described under the International Rules of Zoological Nomenclature. A number of these new genera were homonyms and all, except the 18 genera mentioned above, were without type designations.

China (1927d) proposed new names for the preoccupied generic names in Melichar (1926a), and later (1938d) discussed the remainder of the manuscript, as did Dr. V. Székessy (Melichar 1951a:72). It is my impression, however, that this part of the manuscript is not in publishable condition. China also (1938d) selected type-species for the genera of Cicadellaria which had been characterized only in Melichar's key, except in those cases where the type-species were undescribed.

Evans (1947a) published a list, prepared by China, of genera with their type-species. Apparently he inadvertently published a number of names of type-species in the tribe Cicadellini (=Tettigellini) which had never been published by Melichar and which are therefore nomina nuda.

Oman (1949a) placed the Nearctic species of Cicadellinae (=Tettigellinae) into genera, partly on the basis of the male genital structures.

Morphology

Cicadelline leafhoppers tend to be more heavily sclerotized than specimens of most other subfamilies of Cicadellidae, especially in the tribe Proconiini. As a result, it has been fairly easy to investigate a number of external characters not previously used in cicadellid taxonomy. Some of these were found to be useful and are discussed below.

On the head, the relative length and width are of some importance; length is measured along the median line and width is measured between the eyes (interocular width) or across the eyes (transocular width). The position of the ocelli with relation to an imaginary line drawn between the anterior angles of the eyes (in dorsal aspect) is also of some use, as well as the relative distance of each ocellus from the median line and from the adjacent eye angle. The contour of the surface of the crown is a useful character. There is often a median fovea which may be complete, extending from the posterior margin to the apex, or partial, not attaining the apex. In many species, there is a more or less distinct elevated area along the posterior margin, between the eyes, in the shape of the letter M. In some species there is a short, distinct, longitudinal carina laterad of each ocellus. Occasionally the texture and pubescence of the surface of the crown are taxonomically useful.

The degree to which the antennal ledges are protuberant, in dorsal

aspect, has long been used as a taxonomic character (these are the "Jochstücke" of Melichar's classification). In most genera (fig. 1a), they appear, in lateral aspect, to extend over the line of the lateral clypeal sutures like the crosspiece of a T. Their surface may be convex, concave, flat, sulcate, or foveate, and in lateral aspect they may or may not be angular or carinate dorsally. Their anterior edges may be steep or gradually slanting (oblique) into the contour of the face. The transition from crown to face may be either gradual or abrupt and marked by an angle or carina.

The clypeus (postclypeus of some authors) is separated from the clypellus (anteclypeus of some authors) by a transclypeal sulcus which may be distinct throughout its length, or obsolescent medially. The ventral portion of the face is usually pubescent in the Proconiini, the pubescence being conspicuous and often involving the clypellus, a portion of the clypeus, the lora, and part or all of the genae. The clypeus may be strongly convex, flattened medially, or with a concave area. It usually bears the impressions of the muscles which dilate the cibarium. The contour of the clypellus may be almost a continuation of the profile of the clypeus, or it may be protuberant in profile, with its lower portion almost parallel to the long axis of the body.

The thorax has several useful characters: Its greatest width compared with the transocular width of the head, the shape of the lateral margins in dorsal aspect (parallel, convergent anteriorly, divergent anteriorly), the sculpturing and pubescence of the disc, the shape of the posterior margin, and the texture of the scutellum. The dorsopleural line of the prothorax is often (almost always in the Proconiini) carinate (fig. 1a). The carina may extend from the humeral angle to the eye (complete) or may end some distance behind the eye (incomplete). The proepisternum is never concealed in the Cicadellinae. The form of the proepimeron (fig. 1a) has been used occasionally in the present classification. In a few genera its posterior margin bears a digitate posterior projection that overlaps the mesepisternum to some extent. In the genus *Phera* the lower margin of the proepimeron is rather wide and is broadly depressed. The mesepimeron (fig. 1a) bears a longitudinal or diagonal groove which receives the coastal margin of the forewings when they are in a position of rest. In many museum specimens, the wings do not rest completely in the groove and are not then considered to be in rest position. Because of the degree of angle from the horizontal of the groove and because of the degree of curvature of the costal area of the forewing, the wing at rest may conceal or reveal (fig. 1a) the meron of the hindleg and even the more dorsally situated metepimeron. This character is of importance in the present classification, although it differs in

such genera as *Cuerna* and *Oncometopia*, which are obviously closely related in other morphological characteristics. When the metepimeron is exposed, in some genera it may have a flattened, angular, shelflike projection which extends laterally above the meron.

The legs offer more characters than are used in the present classification. The anterior tibiae are broadly flattened and dilated in some genera. The posterior femora in most taxa of leafhoppers bear chaetotaxal characters at the apex of the femur (fig. 1b–e), as first shown by Ribaut (1952a). These characters tend to be much more variable in Cicadellinae than in other subfamilies of leafhoppers. They are much more variable in the Proconiini than in the Cicadellini, although variation in the latter tribe has already been demonstrated by Frediani (1954, 1956). There is always at least a pair of setae at the apex of the posterior femur. Rarely, there are three setae in this position. More basally there may be one, two, or three setae. If two or more are present proximal to the distal pair, they are almost always arranged serially. A very unusual arrangement of the apical setae of the posterior femora occurs in some *Proconia* species. These are discussed under that genus. The posterior femoral setal arrangement is expressed hereinafter by a formula, e.g., 2:0:0 (paired apical setae, none more proximal to these) (fig. 1b), 2:1:0 (paired apical setae, one more proximal) (fig. 1c), 2:1:1 (paired apical setae, and two serially arranged more proximal setae) (fig. 1d), or 2:1:1:1 (paired apical setae, and three serially arranged more proximal setae) (fig. 1e). The length of the posterior femur, whether or not, with the legs at rest position, it extends forward far enough so that the hindknee (femorotibial joint) attains the posterior procpimeral margin, is a character which has been previously used in cicadellid taxonomy; it is found to be quite useful in the present classification. The shape of the posterior tibia, whether in cross section it is quadrilateral (fig. 1f) with the sides more or less equal in length, or whether it is greatly flattened, is useful in classification to some degree. Each of the angles of the posterior tibia bears a row of large setae in this subfamily. There is some variation in the arrangement of the very large posterior tibial setae. For descriptive purposes, the rows of setae on the posterior tibiae have been numbered (fig. 1f). The innermost of the tibial setal rows, located on the surface of the tibia which lies distal to the adlateral of the paired apical femoral setae, in rest position, is designated row 1. The tibial row of setae located distally from the ablateral of the apical pair of femoral setae is designated row 2. Continuing around the tibia in the same direction are rows 3 and 4. The useful taxonomic characters have been found in tibial rows 1 and 2 of the posterior tibiae. Row 2 may consist entirely

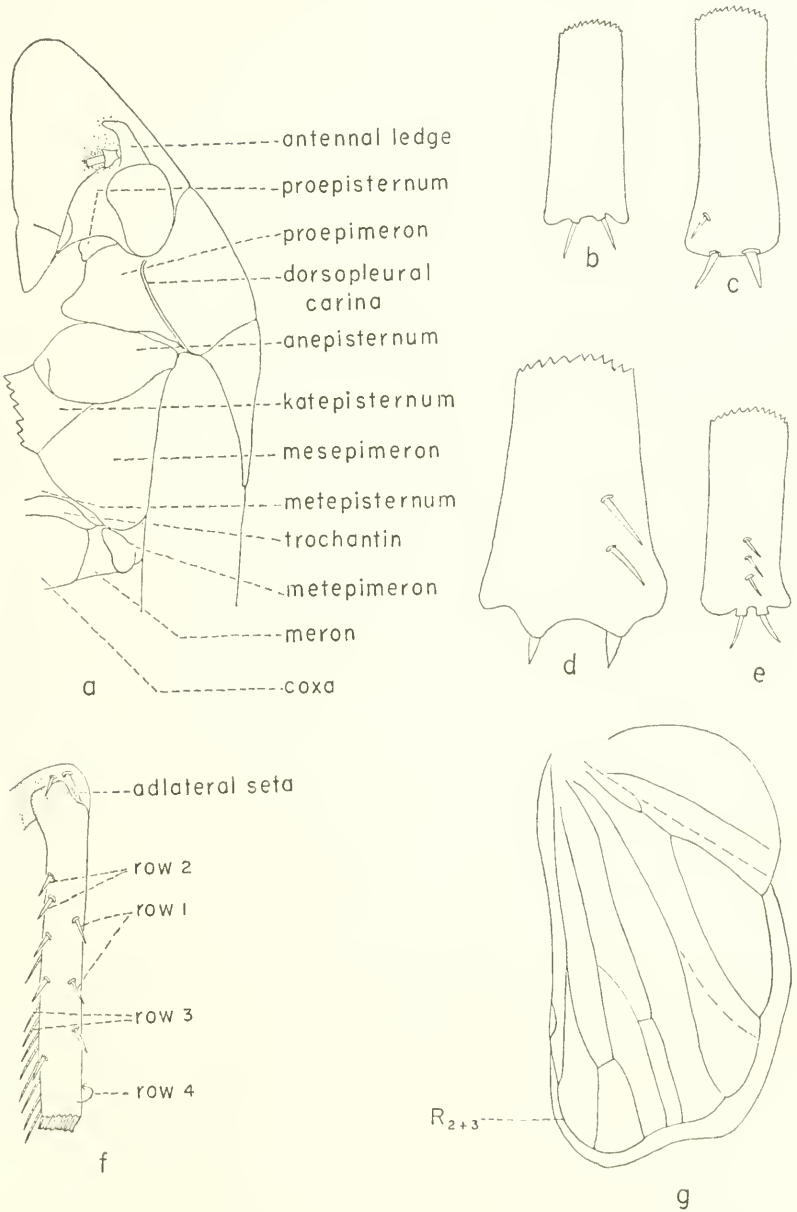


FIGURE 1.—**a,** *Pseudophera divergens* Schmidt, head and thorax, lateral view; **b-e,** posterior femoral apex of: **b,** *Tapajosa spinata*, new species, **c,** *Ichthyobelus platyrrhinus*, new species, **d,** *Abana gigas* (Fowler), **e,** *Egidemia inflata*, new species; **f,** *Paraulacizes irrorata* (Fabricius), posterior femorotibial joint and portion of tibia; **g,** *Splonia brevis* (Walker), hindwing.

of gross macrosetae, or there may be intercalary small macrosetae arranged uniseriately between the gross macrosetae.

Also, on the hindlegs, the relative length of the first tarsomere compared to the combined length of the second and third tarsomeres has been found to be useful in the present study. The length is measured from a lateral or mesal aspect, so that the joints and not merely the tarsal subsegments are seen.

On the forewing, useful characters include the presence or absence of a membrane and its extent when present, whether or not the veins are elevated, the sculpturing and texture of the surface, the number of cells at the apical margin and their relative length, the presence or absence of supernumerary crossveins, and whether or not the claval veins are fused. Apical cells are numbered beginning at the commissural margin when the wings are at rest. The brachial cell is that cell of the corium which is adjacent to the claval suture.

On the hindwing, whether vein R_{2+3} is interrupted or not has been found to be of taxonomic importance (fig. 1g).

The male genitalia provided a number of characters useful in the present classification. Abdominal segment IX, the pygofer, may or may not be strongly produced posteriorly, and the contours of its dorsal and lateral margins are often useful. The chaetotaxy of the surface of the pygofer is also used. Two sorts of setae are found on the pygofer—one notably thicker than the other at low magnifications. The thicker setae are referred to as macrosetae; the thinner (usually linear at low magnifications) as microsetae. The distinction is admittedly loose but it works well in practice, for few cases of setae of intermediate thickness (small macrosetae) have been found. The pygofer also frequently bears processes of which the point of origin and the shape have been used as characters. The sternum of the male abdominal segment IX bears a pair of lobes, the plates, in all Cicadellidae. Their length, shape, chaetotaxy, and degree of fusion along the median line are of taxonomic value.

Also, in the male, a pair of styles form a part of the so-called "internal genitalia." Their length and form are useful although not always consistent intraspecifically. Extending between the basal portions of the styles is the connective, which has been regarded as a basal piece of the intromittent organ by morphologists. Its length and form and the presence or absence of a dorsal median keel are of taxonomic significance.

In most Cicadellidae, the apical portion (aedeagus) of the intromittent organ articulates basally with the connective. In the Cicadellinae there are numerous exceptions to this, and it is believed that departures from this widespread condition have occurred independently in several

lineages of taxa. In these exceptions, the base of the aedeagus is connected to the connective only by membrane. In such cases, the connections to the anal tube are often much stronger than those to the connective, and in some genera (e.g., *Anacuerna*, new genus) the association of the aedeagus with the anal tube is very close. The form of the aedeagus, the presence or absence of aedeagal processes, and their form when present, are useful characters in the present classification.

Accessory genital structures (paraphyses) are of frequent occurrence in the Cicadellinae. They are believed to have arisen independently and in several ways in a number of genera. Most commonly they occur between the apex of the connective and the base of the aedeagus, without articulations. Usually they are paired, but occasionally they are reduced to a platelike structure which may appear as an extra sclerite between the connective and aedeagus. They may be very closely associated with the aedeagus basally; in some genera (e.g., *Diestostemma*) a species in which they are distinctly separate from the aedeagus may be closely related to a species with similar structures which are definitely attached to the aedeagus, not merely by membrane, and which must be considered aedeagal processes. In a few genera (e.g., *Homoscarta*) the paraphyses articulate with the apex of the connective.

Sclerites may occur in the posterior membrane of the pygofer (conjunctiva IX–X) of the male. These may be connected dorsally with the normally sclerotized portion of the pygofer in some genera, suggesting such a mode of origin, but in others they are completely separate sclerites. In some genera they may give off elongate processes which resemble paraphyses in other genera.

The anal tube rarely possesses processes, but they do occur in some genera (e.g., *Acrogonia*).

The shape of the posterior margin of abdominal sternum VII of the female is also a useful character.

Technique

The technique used for the preparation, study, and preservation of the male genitalia has been described by Oman (1949a:21), and some modifications, by Young and Beirne (1958a:2). It is important to reemphasize that the small vials in which the genitalia are stored frequently get shaken up during shipment, with the result that the glycerine comes in contact with the cork. If this has happened, it is an important curatorial responsibility to transfer the preparations to clean vials in a few drops of glycerine and to replace the corks.

If this is not done, eventually there will be damage to the labels and the pin, and ultimately to the preparations.

In preparing the wings for illustration, the most satisfactory method is to prepare a dry mount on a microscope slide. A large, square cover glass with a very small amount of a quick-drying adhesive at each corner is used to hold the wings in place. If too much adhesive is used, however, it will run under the cover glass to the wings and cause difficulties in following the course of the veins.

Illustrations

The illustrations were made with the aid of a camera lucida, either by the author or by Mrs. Judith Stewart under his direction. A number of the illustrations made by the author were inked by Miss Gillian M. Day at the British Museum (Natural History) and by Miss Patricia Thompson of Raleigh, N.C. Since most of the species have good qualitative characters, no attempt has been made to indicate the scale of the drawings. The technique used to prepare the structures for illustration has been discussed in detail by Young and Beirne (1958a:3).

The figures in the systematic portion of this work are lettered uniformly, as follows:

a, anterior dorsum (head, pronotum, and occasionally the scutellum), in dorsal aspect;
b, same structures as in **a,** in lateral aspect;
c, male pygofer and plates (setae of plates usually not shown), lateral aspect;
d, one male plate, ventral aspect;
e, one style and the connective, dorsal aspect;
f, aedeagus, lateral aspect;
g, aedeagus, caudoventral aspect;
h, male paraphyses;
i, female abdominal sternum VII.

These explanations are not repeated hereafter in the legends to the figures. Additional structures illustrated are not lettered consistently but are explained in the respective legends. When the relationship of one of a pair of bilateral structures to its complement is important, the location of the median line has been indicated by a broken vertical line. It should be added here, as a precaution to the reader, that the outline drawings "a" and "b" were, for the greater part, not made with the intent of publishing them, but only as an adjunct for the writer's own use, to supplement other characters. They are published as a result of the urging of Dr. James P. Kramer, of the U.S. Department of Agriculture, who insisted that they would be of great assistance to a reader, even if not as accurate as the other illustrations.

Subfamily CICADELLINAE

Apparently the first use of a higher category name based on *Cicadella* Latreille was that of Latreille (1825a), but the family (and of course the nominate subfamily) name used since 1825 by various authors has been inconsistent. Signoret (see p. 7), in his monograph of the subfamily, referred to the higher category as "Tettigonides," presumably based on *Tetigonia* Geoffroy, 1762. "Tettigonides" dates to Amyot and Serville, 1843. "Tettigonides" was finally suppressed by the International Commission of Zoological Nomenclature (Opinion 647, 1963).

Another group of authors used "Cicadellidae," based on Latreille (1817b) as a higher category name, but a cloud of uncertainty came over this usage with the discovery that Duméril (1806a) had used the name *Cicadella* for a genus now in the Typhlocybinae. A substitute name for *Cicadella* Latreille (not Duméril), *Tettigella* China and Fennah (1945a), was proposed and the higher category names Tettigellidae and Tettigellinae were based on this. The International Commission (op. cit.) achieved stability by suppressing *Cicadella* Duméril and *Tettigella* China and Fennah and by placing *Cicadella* Latreille, 1817, on the Official List of Generic Names in Zoology, under the plenary powers.

The leafhoppers have recently been treated as a superfamily by a number of authors, including Dr. Z. P. Metcalf whose excellent catalogues of this group are still partly in press. I do not accept this usage for two reasons. First, the elevation of the subfamilies to family level does not maintain a good perspective in the auchenorrhynchous Homoptera; the size of the gaps between most of the families of the Fulgoroidea and those which separate the so-called families of leafhoppers are not similar. Second, it is held that families form a part of the culture of the general zoologist, and that their wanton creation does a disservice to the stability of that culture. Eventually (after considerably more is known about the lower taxa) it may be desirable to elevate some of the subfamilies to family status, but it is much better to postpone this until the subfamilies acquire a degree of stability they do not now possess. A pertinent example is to be found in the treatment of the Makilingini (see below). In this regard, it is here submitted that the interrelationships of the Nirvaninae, Cicadellinae, and Typhlocybinae are much closer than is the relationship of the Xestocephalinae to their nearest relatives.

The subfamily Cicadellinae is very large and diverse, hence difficult to characterize. It contains leafhoppers ranging from very large (22 mm.) in size to almost as small as the larger Typhlocybinae, a sub-

family which includes the smallest of the leafhoppers. It is proposed here to include only the tribes Proconiini and Cicadellini in the subfamily. The higher category based on *Makilingia* is considered to be of subfamily status and will be so treated by me in another paper. The tribe Milcewanini is more closely related to the subfamily Typhlocybinae than to the Cicadellinae and has been removed from the Cicadellinae to the Typhlocybinae by me (1965a). Oman's (1949a) placement of the Evacanthini in the Cicadellinae is not followed here; this group is considered at this time to be of subfamily status. The higher category based on *Errhomenellus* Puton is also here regarded as of subfamily status.

After the above changes have been taken into account, the subfamily Cicadellinae may be characterized as follows: Leafhoppers with the ocelli located on crown, nearly always closer to the posterior margin than to apex or to anterolateral margin (exception: some species of *Mesogonia*); species usually not flattened dorsoventrally; forewing with outer margin of inner apical cell parallel to long axis of wing; posterior tibiae with macrosetae in four regular rows; proepisternum exposed; lateral clypeal sutures extending onto crown and almost always extending to or near ocelli. This subfamily includes taxa from all of the zoogeographical regions of the world. It is especially rich in species from the Neotropical region, relatively poor in species from North America and from Africa; in Europe it is represented by only one genus with a single species.

The key to tribes (p. 17), although it is the best I have been able to devise, will not work for all specimens. Difficulties arise chiefly as a result of intraspecific variation; for example, in the genera *Keonolla*, *Neokolla*, and *Manzutus* in the Cicadellini, where a single species may include specimens which violate the hind knee-proepimeron character and also have antennal ledges which are not protuberant.

The genera included by Metcalf (1965a), but not treated here, are excluded from the Proconiini; they will be dealt with later. Certain species included by Metcalf in the genera treated in this part of this study are not here included; these will be treated later, either in new combinations or as species of uncertain position. Only 16 species presently remain completely unknown to me.

Certain species have been incriminated as plant virus vectors, the greatest number from North America, where Oman (1949a:11) reported 15 species of the subfamily, as restricted here, to be vectors of three plant diseases. It should be kept in mind, however, that relatively few species occur in America north of Mexico, and that much more is known about these than of the great majority of cicadelline leafhoppers. Turner and Pollard have published (1959a) the results of years of study

of the bionomics of the vectors of Phony Peach Disease and also (1959b) a more specialized account of the transmission of the disease. The former is a major modern contribution to our knowledge of the subject.

As far as is known, all the species of Cicadellinae are xylem feeders.

KEY TO TRIBES OF CICADELLINAE

Posterior legs at rest with knees not attaining posterior proepimeral margins (exception: *Splonia* Signoret) and male pygofer and plates both usually with numerous evenly dispersed microsetae (occasionally with a few interspersed macrosetae); antennal ledges usually protuberant in dorsal aspect . . . . . PROCONIINI

Posterior legs at rest with knees nearly always attaining posterior proepimeral margins and either male plates or pygofer, or both, with macrosetae or with microsetae not evenly dispersed; antennal ledges usually not protuberant in dorsal aspect . . . . . CICADELLINI

Tribe PROCONIINI

Proconiida Dallas, 1870a:495.

Cicadelline leafhoppers of moderate to large size. Head with ocelli much closer to posterior margin than to apex; lateral clypeal sutures nearly always extending onto crown; antennal ledges protuberant in dorsal aspect; transclypeal suture almost always incomplete; face almost always pubescent. Prothorax in lateral aspect usually with a carina on dorsopleural line. Hindlegs at rest with knees not attaining posterior proepimeral margins (exception: *Splonia* Signoret); posterior femoral setal formula almost always 2:0:0, 2:1:0, 2:1:1, or 2:1:1:1; posterior tibial setal row 2 without intercalary small macrosetae. Male pygofer and plates with numerous evenly dispersed microsetae, or if macrosetae are present, these are interspersed among microsetae. Distribution, Western Hemisphere.

Included in the Proconiini are the largest leafhoppers. The genera fall into a number of groups, but it has been found difficult to make a synoptic key to the groups. The relationships are represented graphically in the diagram on pages 18–19. Genera bearing numbers 33 to 55 share the character of the posterior meron being exposed when the forewings are in rest position; but *Cuerna*, which is undoubtedly closely related to *Oncometopia* and its relatives, lacks this character, as do *Anacuerna* and *Dechacona*, which are believed to be closely related to *Cuerna*. On the other hand, the posterior meron is exposed in *Desamera* which appears to be closely related to *Ciccus* and *Procandea* in both of which the posterior meron is concealed.

POSTERIOR MERON CONCEALED

1. Lojata
2. Proconia
3. Diestostemma
4. Homoscarta
5. Dictyodisca
6. Stictoscarta
7. Yunga
8. Mareba
9. Proconobola
10. Zyzzogeton
11. Procandea
12. Ciccus
22. Cicciana
23. Peltocheirus
24. Yotala
25. Acrocampsa
26. Paracrocampsa
27. Anacrocampsa
28. Ichthyobelus
29. Catorthorrhinus

POSTERIOR MERON EXPOSED

32. Abana
33. Deselvana
34. Omagua
35. Rhaphirrhinus
36. Acrobelus
37. Teletusa
38. Desamera
39. Tretogonia
40. Cyrtodisca

31. Ochrostacta

13. Procama
14. Depanana
15. Depanisca
16. Aulacizes
17. Paraulacizes
18. Pseudometopia
19. Proconosama

20. Amblydisca
21. Proconopera

30. Splonia

52. Cuerna
53. Anacuerna
54. Dechacona

41. Egidemia

42. Phera
43. Homalodisca
44. Propetes
45. Pseudophera
46. Dichrophleps
47. Oncometopia
48. Hyogonia
49. Quichira
50. Tapajosa
51. Molomea

55. Acrogonia

In the five proconiine species studied by Turner and Pollard (1959a), the eggs are laid in clusters, whereas in the single cicadelline species they studied, the eggs were laid singly. Further study is needed to determine whether this character is of tribal significance.

KEY TO GENERA OF PROCONIINI

1. Large, robust species, brachypterous, completely covered with pubescence; posterior tibiae without macrosetae.
   1. **Lojata** Strand (p. 25)
   Without the above combination of characters 2
2. Forewing at rest not exposing meron of hindleg 3
   Forewing at rest exposing meron of hindleg 37
3. Apex of head with a very short, blunt projection (fig. 25a) or a circular scar (in frontal view); species usually white and with a posteriorly directed digitate process (fig. 25b) on posterior margin of proepimeron or dark and with a strongly elevated median pronotal keel (fig. 3b) 4
   Apex of head with projection absent, or pronounced if present; species without additional characters set forth above. . . . 5
4. Pronotum with a strongly elevated median keel; proepimeron without a posteriorly directed digitate process from hindmargin.
   2. **Proconia** Le Peletier and Serville (p. 26)
   Pronotum not keeled medially; proepimeron with a posteriorly directed digitate process from hindmargin.
   3. **Diestostemma** Amyot and Serville (p. 30)
5. Male plates fused almost throughout their length. 6
   Male plates fused only basally, or not at all 10
6. Forewing with an anteapical plexus of veins in corium (fig. 54m) 7
   Forewing without such a plexus . . . 6. **Stictoscarta** Stål (p. 53)
7. Pronotum with pair of conspicuous conical elevations extending dorsally and laterally (fig. 54b).
   10. **Zyzzogeton** Breddin (p. 67)
   Pronotum without such elevations. 8
8. Male genital capsule with sclerites on posterior membrane; head triangularly produced . . . . . 7. **Yunga** Melichar (p. 57)
   Male genital capsule without such sclerites; head not produced, its anterior margin broadly rounded 9
9. Forewing without a membrane; male with paraphyses present; South American species . . . 4. **Homoscarta** Melichar (p. 46)
   Forewing with a membrane; male without paraphyses; Central American species . . . . . 5. **Dictyodisca** Schmidt (p. 50)

10. Male pygofer with processes arising on dorsal margin, extending ventrally 11
Male pygofer with processes arising elsewhere, or without processes 16
11. Face with contour of clypellus continuing profile of clypeus. . 12
Face with contour of lower portion of clypellus at right angle to profile of clypeus, or nearly so (fig. 105b). 15
12. Aedeagus with a scoop-shaped process near apex (fig. 78j).
16. **Aulacizes** Amyot and Serville (p. 89)
Aedeagus not so. 13
13. Hindwing with vein R_{2+3} entire (fig. 1g) 14
Hindwing with vein R_{2+3} interrupted.
19. **Proconosama**, new genus (p. 106)
14. Clypeus strongly inflated, aedeagus appearing inflated in caudoventral aspect (fig. 94m).
18. **Pseudometopia** Schmidt (p. 99)
Without either of above characters.
17. **Paraulacizes**, new genus (p. 93)
15. Crown of head with median fovea narrowed apically; dorsopleural prothoracic carinae complete. . 20. **Amblydisca** Stål (p. 109)
Crown of head with median fovea not so; dorsopleural prothoracic carinae incomplete. . . 21. **Proconopera**, new genus (p. 113)
16. Hindwing with vein R_{2+3} entire (fig. 1g). 17
Hindwing with vein R_{2+3} incomplete. 27
17. Hindlegs in rest position with knees each attaining posterior proepimeral margin. . . . . 30. **Splonia** Signoret (p. 141)
Hindlegs with knees not attaining posterior proepimeral margin. 18
18. Forewings coarsely wrinkled; male plates with an apical acute, tapered process (fig. 51d). 9. **Proconobola**, new genus (p. 64)
Without either of above characters. 19
19. Contour of lower portion of clypellus at right angle to profile of clypeus, or nearly so 20
Contour of clypellus continuing profile of clypeus. 21
20. Posterior tibiae with setal rows 1 and 2 close set, the distance between adjacent setae of each row nearly equal; posterior membrane of genital capsule without sclerites.
11. **Procandea**, new genus (p. 69)
Posterior tibiae with setal row 1 close set, row 2 widely spaced; posterior membrane of male genital capsule with sclerites (fig. 71k, m). . . . . .12. **Ciccus** Latreille (p. 80)

21. Forewing with an anteapical discal plexus of veins.
8. **Mareba** Distant (p. 60)
Forewing without an anteapical discal plexus of veins. . . . 22
22. Antennal ledges not foveate; pygofer with two pairs of processes each resembling a clump of setae (fig. 110j).
22. **Cicciana** Metcalf (p. 115)
Not as above 23
23. Crown of head with a median fovea; forewing with anteapical supernumerary veins to costa; male plates separate throughout their length 24
Crown of head without a median fovea; forewing without such veins; male plates occasionally fused in basal half their length 26
24. Clypeus in profile bulbously expanded (fig. 112b). 25
Clypeus in profile not expanded. . 25. **Acrocampsa** Stål (p. 123)
25. Male pygofer moderately produced, posterior margin concave; style truncate apically. . . . . 24. **Yotala** Melichar (p. 122)
Male pygofer strongly produced, posterior margin not truncate; style not truncate apically. . 23. **Peltocheirus** Walker (p. 118)
26. Male plates fused in basal half their length.
53. **Anacuerna**, new genus (p. 253)
Male plates separate throughout their length.
52. **Cuerna** Melichar (p. 251)
27. Crown of head inflated . . . . . 31. **Ochrostacta** Stål (p. 145)
Head not so. 28
28. Male abdominal conjunctiva IX–X in caudal aspect with a pair of sclerites (fig. 74j) 29
Male abdominal conjunctiva IX–X without sclerites. 30
29. Male plates fused basally; aedeagus with an unpaired ventral process in apical half . . . 14. **Depanana**, new genus (p. 85)
Male plates separate throughout their length; aedeagus with paired processes only . . . 15. **Depanisca**, new genus (p. 87)
30. Head produced apically in a broad troughlike or scooplike process (fig. 127a). . . . . 28. **Ichthyobelus** Melichar (p. 135)
Head with or without apical process; when present not as above 31
31. Head with a distinct apical process.
29. **Catorthorrhinus** Fowler (p. 140)
Head without an apical process 32
32. Male plates fused basally; paraphyses absent.
13. **Procama**, new genus (p. 83)
Male plates separate throughout their length; paraphyses present 33

33. Length 17 mm. or more; aedeagus with pair of broad short truncate processes . . . . . .32. **Abana** Distant (p. 148)
Length less than 15 mm.; aedeagus without such processes . . 34
34. Clypellus with contour of lower portion at right angle to profile of clypeus. 35
Clypellus with contour of lower portion continuing profile of clypeus. 36
35. Male with connective very short; style apices truncate (figs. 121–124). . . . . .26. **Paracrocampsa**, new genus (p. 128)
Male with connective extending almost as far posteriorly as style apices; style apices not truncate (figs. 125, 126).
27. **Anacrocampsa**, new genus (p. 133)
36. Aedeagus with shaft curved anteriorly in lateral aspect, with two pairs of processes . . . . . 52. **Cuerna** Melichar (p. 251)
Aedeagus with shaft not so curved, with only a single pair of processes arising more basally.
54. **Dechacona**, new genus (p. 255)
37. Pronotum and forewings coarsely pitted; pronotum with posterior margin convex and extending posteriorly to or nearly to transverse impression of scutellum.
39. **Tretogonia** Melichar (p. 166)
Without above combination of characters 38
38. Clypellus with contour of its lower portion at an angle to profile of clypeus. 39
Clypellus with contour of its lower portion continuing profile of clypeus. 41
39. Male pygofer with processes arising from conjunctiva IX–X.
38. **Desamera**, new genus (p. 164)
Without such processes 40
40. Face in profile vertical; length 11.5 mm. or less.
37. **Teletusa** Distant (p. 162)
Face in profile slanting posteroventrally; length 17 mm. or more.
32. **Abana** Distant (p. 148)
41. Male genitalia with paraphyses present 42
Male genitalia without paraphyses 45
42. Male pygofer in lateral aspect slender and strongly tapered in apical half, dorsal margin usually with emargination in apical half (fig. 144c); head occasionally with an apical threadlike process (fig. 148b) 43
Male pygofer in lateral aspect broader, apex broadly rounded, dorsal margin without an emargination; head with a broader, more gradually tapered apical process (fig. 149a).
36. **Acrobelus** Stål (p. 160)

43. Head with a threadlike apical process.
35. **Rhaphirrhinus** Laporte (p. 157)
Head without such a process 44
44. Connective very elongate, stem extending farther posteriorly than apex of style . . . . 33. **Deselvana**, new genus (p. 151)
Connective not extending posteriorly as far as style apex.
34. **Omagua** Melichar (p. 156)
45. Hindwing with vein R_{2+3} entire (fig. 1g) 46
Hindwing with vein R_{2+3} incomplete (exception: *Molomea personata* (Signoret)) 48
46. Length 17 mm. or more; crown of head with a longitudinal carina laterad of each ocellus; hindleg with length of first tarsomere greater than combined length of second and third tarsomeres.
40. **Cyrtodisca** Stål (p. 174)
Length less than 14 mm.; crown of head without such carinae; hindleg with length of first tarsomere equal to, or less than combined length of second and third tarsomeres 47
47. Head subangulate at transition from crown to face, disc of crown concave, clypeus flattened medially; forewing with numerous shallow pits in clavus and corium (Central American species).
49. **Quichira**, new genus (p. 233)
Head with crown rounded to face, disc of crown convex, clypeus convex medially; forewing without such pits (South American species) . . . . . 48. **Hyogonia** China (p. 230)
48. Apex of head curved slightly dorsally and angulate at transition from crown to face (fig. 247b); male pygofer very long, exceeding wing apices with wings at rest position.
55. **Acrogonia** Stål (p. 257)
Without above combination of characters 49
49. Metepimeron with shelflike projection upon which forewing rests when in rest position; male plates separate throughout their length. 50
Metepimeron without such a projection or with a very weak one; male plates often fused basally 57
50. Abdomen not constricted basally. 51
Abdomen constricted basally. 56
51. Clypeus with texture of dorsomedian area granular 52
Clypeus with texture of dorsomedian area rugose, glabrous, or otherwise, but not granular. 53
52. Forewings hyaline or translucent; pygofer processes when present not arising on ventral margin before apex (exception: *speculifera* (Walker)). . . . . 41. **Egidemia** China (p. 176)
Forewings opaque; pygofer processes arising on ventral margin before apex. . . . . 47. **Oncometopia** Stål (p. 220)

53. Forewing with claval veins fused almost throughout their length. 46. **Dichrophleps** Stål (p. 211)
Forewing with claval veins separate for a considerable distance at base and apex 54
54. Length 16 mm. or more. . 45. **Pseudophera** Melichar (p. 206)
Length 15 mm. or less. 55
55. Pronotum with a distinct transverse sulcus parallel to anterior margin, delimiting a collarlike anterior portion. 44. **Propetes** Walker (p. 204)
Pronotum not as above 56
56. Proepimeron with ventral marginal area depressed. 42. **Phera** Stål (p. 184)
Proepimeron with ventral marginal area not depressed. 43. **Homalodisca** Stål (p. 193)
57. Clypeus with muscle impressions distinct; male plates extremely short, not extending posteriorly to midlength of ventral pygofer margin. . . . . 51. **Molomea** China (p. 239)
Clypeus with muscle impressions obscure; male plates longer, extending posteriorly beyond midlength of ventral pygofer margin. . . . . 50. **Tapajosa** Melichar (p. 234)

1. Genus LOJATA Strand

FIGURE 2

Loja Schmidt, 1932a:45. Type-species: *L. ohausi* Schmidt (1932a:47), by monotypy. Preoccupied.

Lojata Strand, 1933a:122, as new name for *Loja* Schmidt, preoccupied.

Length of female 16.5 mm.

Head well produced, anterior margin obtusely angulate in dorsal aspect, with a distinct carina between crown and face, ocelli located considerably before a line between anterior angles of eyes, each closer to median line than to adjacent eye angle, posterior portion of surface elevated and with pair of conspicuous tuberosities bordering posterior margin, with pair of divergent foveae on anterior half, disc thickly pubescent, lateral clypeal sutures extending onto crown and attaining ocelli; antennal ledges protuberant, not foveate, not carinate dorsally in lateral aspect, anterior margins steeply declivous; clypeus slightly depressed medially; muscle impressions indistinct; transclypeal suture obsolete; entire face heavily pubescent; clypellus not produced, its contour more or less continuing profile of clypeus.

Thorax with greatest pronotal width equal to transocular width of head, lateral margins convergent anteriorly, disc very coarsely wrinkled with a pair of rounded elevations bordering posterior margin, with pits

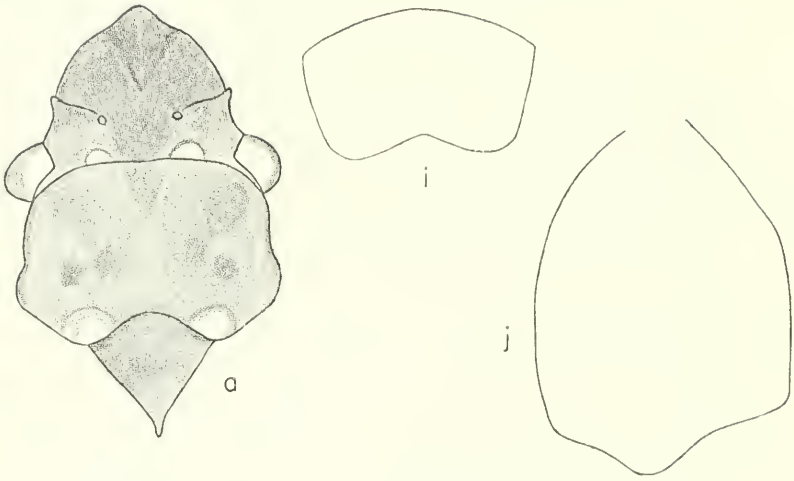


FIGURE 2.—*Lojata ohausi* (Schmidt), type: j, forewing, outline.

on the elevations, disc strongly pubescent, posterior margin concave, with a complete strong dorsopleural keel; scutellum coarsely pubescent, without striae on posterior portion. Forewing brachypterous, exposing five abdominal terga, without membrane, veins indistinct, texture strongly coriaceous with several conspicuous callosities. Hindwing brachypterous, much shorter than forewing, venation abnormal. Hindlegs at rest with knees not attaining posterior proepimeral margins, setal formula 2:0:0; first tarsomere with length less than combined length of second and third.

Female abdominal sternum VII with posterior margin transverse and rectilinear.

Lojata is known only from the holotype of the type-species from Ecuador. Its relationships to other genera are difficult to assess because of its brachyptery and because of the lack of male specimens.

2. *Genus* PROCONIA Le Peletier and Serville

FIGURES 3–6

Proconia Le Peletier and Serville, 1825a:610. Type-species: *Cicada cristata* Fabricius, preoccupied = *Proconia esmeraldae* Melichar, by monotypy.

Germaria Laporte, 1832b:222. Type-species: *G. cucullata* Laporte, which is a synonym of *Cicada marmorata* Fabricius, by monotypy.

Zyzza Kirkaldy, 1900b:243. New name for *Germaria* Laporte.

Eustollia Goding, 1926a:105. Type-species: *Cicada jubata* Goding, which is a synonym of *C. marmorata* Fabricius, by monotypy.

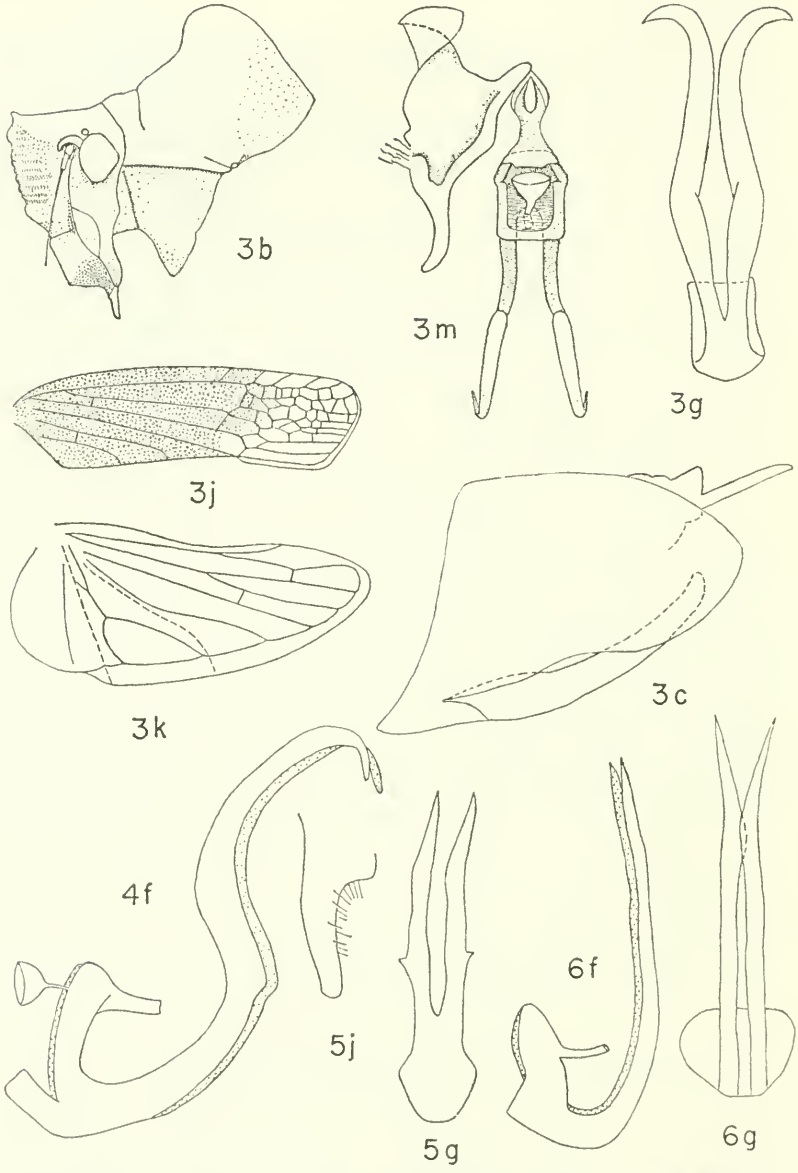
Length 18–20 mm.

Head strongly produced and triangular, median length usually equal to or exceeding interocular width, anterior margin varying from angulate to narrowly curved in dorsal aspect, without an apical carina between crown and face, ocelli located on or behind a line between anterior angles of eyes, each ocellus midway between inner eye margin and midline of crown, with or without a posterior M-shaped elevation bordering posterior margin, with a narrow median fovea extending almost full length of crown, without a longitudinal carina laterad of each ocellus; antennal ledges not sulcate nor carinate in lateral aspect, with anterior margin strongly declivous; clypeus with disc flattened or depressed, with muscle impressions distinct; facial pubescence obscure or absent; clypellus produced and carinate medially, contour of its lower portion at right angle to profile of face.

Thorax with pronotal width much greater than transocular width of head, with lateral margins strongly convergent anteriorly, surface pitted on posterior two-thirds, disc with a conspicuously elevated median keel which is steeply declivous anteriorly, gradually sloping posteriorly, without pubescence, posterior margins slightly concave, with a complete, nearly rectilinear, distinct, dorsopleural carina on each side; scutellum usually transversely striate on posterior half. Forewing with a membrane, veins not strongly elevated, often indistinct, clavus and corium strongly coriaceous and varying from pitted to closely punctate, with more than four apical cells, with an anteapical plexus of veins on corium and with supernumerary crossveins to costal margin, wing apices obliquely truncate, wings of female at rest concealing apex of ovipositor. Hindwing at rest extending almost as far posteriorly as forewing apex; vein R_{2+3} incomplete. Hindlegs with femoral setal formula 2:1:1 or 4:1:1 (see discussion below); first tarsomere with length less than combined length of second and third.

Male genitalia: Pygofer well produced, rounded, with numerous dispersed microsetae and occasionally a few macrosetae on posterior half, without processes. Plates separate throughout length; not extending posteriorly as far as, or extending beyond pygofer apex, triangular, with dispersed microsetae and occasionally interspersed macrosetae. Style extending farther posteriorly than apex of connective, with preapical lobe, rounded apically. Connective Y-shaped with arms contiguous at anterior ends. Aedeagus with shaft very short, with a pair of elongate processes arising basally and extending posterodorsally or posteriorly, very much longer than shaft. Paraphyses absent.

Female abdominal sternum VII with posterior margin uniformly shallowly concave.



FIGURES 3–6.—3, *Proconia marmorata* (Fabricius), specimens from Amazonas: j, forewing; k, hindwing; m, style, connective, and aedeagus. 4, *P. fusca* Melichar, from Pachitea, Peru. 5, *P. esmeraldae* Melichar, from French Guiana: j, style apex in broadest aspect. 6, *P. lutzi* Schmidt, lectotype.

Proconia occurs in northern and central South America. The posterior setal formula 2:1:1 is like that of many of the Cicadellini, but this is misleading, for the penultimate two single setae are located much more laterally than their usual position in the Cicadellini. The condition of four apical femoral setae is extremely unusual in Cicadellidae. In the possession of a circular scar, beneath the apex of the head, this genus stands apart from the other proconiine genera except *Diestostemma* Amyot and Serville, to which it appears to be related also in the venation of the forewing and the structure of the aedeagus. The last character, however, is not at all strong and might be used to relate *Proconia* to several other proconiine genera. The median pronotal keel will readily separate *Proconia* from all other cicadelline genera.

The classification below is severe; there is a great deal of intraspecific variation. Only those species for which distinct characters in the male genitalia have been found are recognized. Some of these exhibit external differences, particularly in the contour of the anterior margin of the median pronotal keel, which should be investigated further when long series become available.

SPECIES OF PROCONIA

[*Type not seen.]

esmeraldae Melichar, 1924a:203. Venezuela, Trinidad Island, Fr. Guiana, Peru.

cristata (Fabricius), 1803a:62 (*Cicada*), preoccupied.

marmorata var. *fabricii* Metcalf, 1965a:482, new name for *Cicada cristata* Fabricius, not Schreber, 1759. New synonymy.

fusca Melichar, 1924a:204. Peru.

lutzi Schmidt, 1928a:32. Ecuador, Peru.

marmorata (Fabricius), 1803a:61 (*Cicada*). Colombia to Bolivia and to SE. Brazil.

**cucullata* (Laporte), 1832b:223 (*Germaria*) [fide Melichar].

**tuberculicollis* (Blanchard and Brullé), 1846:222 (*Cercopis*) [fide Nast].

dorsicrista (Walker), 1858a:97 (*Germaria*).

var. *boliviana*, *Proconia marmorata* Melichar, 1924a:203. New synonymy.

solita Melichar, 1924a:204. New synonymy.

bicolorata Melichar, 1924a:204. New synonymy.

**jubata* (Goding), 1926a:105 (*Cicada*) [fide Melichar].

bipunctata Schmidt, 1928a:33. New synonymy.

rubromaculata Schmidt, 1928a:31. New synonymy.

andina Schmidt, 1928a:34. New synonymy.

sulphurea Schmidt, 1928a:35. New synonymy.

KEY TO MALES OF PROCONIA

1. Aedeagal processes strongly bisinuate 2
   Aedeagal processes not so 3
2. Aedeagal processes with a slight rounded protuberance near midlength . . . . . **P. fusca** Melichar (fig. 4)
   Aedeagal processes without such a protuberance.
   P. marmorata (Fabricius) (fig. 3)
3. Aedeagal processes with a slight angular protuberance before midlength. . . . . **P. esmeraldae** Melichar (fig. 5)
   Aedeagal processes without any protuberance.
   P. lutzi Schmidt (fig. 6)

3. *Genus* DIESTOSTEMMA Amyot and Serville

FIGURES 7–32

Diestostemma Amyot and Serville, 1843a:572. Type-species: *Cicada albipennis* Fabricius, by original designation and monotypy.

Leucopepla Kirkaldy, 1907d:87. Type-species: *Tettigonia bituberculata* Signoret, by original designation. New synonymy.

Heterostemma Melichar, 1924a:227. Type-species: *Tettigonia nervosa* Signoret, by original designation. New synonymy.

Chiapasa Schmidt, 1928a:40. Type-species: *Tettigonia rugicollis* Signoret, by original designation and monotypy. New synonymy.

Pibrochoides Haupt, 1929c:252. Type-species: *Tettigonia rugicollis* Signoret, by original designation.

Length 13–22 mm.

Head strongly produced, median length greater than interocular width (occasionally greater than transocular width), anterior margin not carinate, nearly always with a short median apical tuberosity, ocelli located on a line between anterior angles of eyes and each usually slightly closer to adjacent eye angle than to median line of crown, nearly always without a distinct M-shaped elevation bordering posterior margin, usually without a median fovea, occasionally with a partial one, without a longitudinal carina laterad of each ocellus, with or without pubescence on disc, lateral clypeal sutures extending onto crown, attaining ocelli; antennal ledges protuberant in dorsal aspect, with or without a longitudinal fovea, in lateral aspect carinate or not dorsally, anterior margin declivous; clypeus convex, depressed, or flattened medially, transclypeal suture not distinct throughout length; face pubescent beneath; clypellus not protuberant, its contour continuing profile of clypeus.

Thorax with pronotum wider than head including eyes, lateral margins convergent anteriorly, disc punctate to pitted and occasionally

strongly rugose, occasionally with short microsetae, posterior margin concave, dorsopleural carinae complete, with each carina rectilinear in lateral aspect, or arched slightly dorsally at middle; proepimeron with a short, posteriorly directed process at midlength of posterior margin; scutellum transversely striate or not on posterior half. Forewing usually whitish opaque and without a membrane, in some species coriaceous or subhyaline with inner apical cell membranous; veins varying interspecifically from obscure to elevated and distinct, surface finely punctate in clavus and corium, with more than four apical cells, the relative lengths of apical cells variable, with a network of veins in apical half of corium, and occasionally in clavus and basal half of corium, with or without anteapical supernumerary crossveins to costal margin; wings of female in rest position entirely concealing ovipositor. Hindwing extending almost as far posteriorly as forewing, vein R_{2+3} incomplete. Hindlegs with femoral setal formula quite variable (2:0:0; 2:1:0; 2:1:1; 2:1:1:1) intraspecifically; first tarsomere shorter than combined length of second and third.

Male genitalia: Pygofer not strongly produced, with numerous evenly dispersed microsetae, without processes. Plates not fused, extending as far as, or usually not as far posteriorly as, pygofer apex, broad and truncate with numerous evenly dispersed microsetae. Style interspecifically variable in length compared with connective, with distinct preapical lobe, apex either simply rounded or variously modified, nearly always with a few anteapical lateral microsetae. Connective longitudinal, usually Y-shaped with arms short and very slightly divergent. Aedeagus usually curved posterodorsally, symmetrical, with or without shaft processes which are rarely asymmetrical. Paraphyses usually present and paired or with processes from base of aedeagal shaft (rarely arising more posteriorly from ventral portion of shaft).

Female abdominal sternum VII quite variable.

Diestostemma has a wide Neotropical distribution from Mexico to Paraguay and Bolivia. It is placed here near *Proconia*, with which it shares the peculiar character of the scar at the apex of the head. Other similarities are discussed under *Proconia* (p. 29). The presence of the digitate posteriorly directed process on the posterior margin of the proepimeron will readily separate *Diestostemma* from other proconiine genera.

Leucopepla Kirkaldy was based on the character of elevations of the dorsum of the pronotum, but in other characters it is similar to typical *Diestostemma*, and the pronotal character intergrades to typical *Diestostemma*. *Heterostemma* Melichar was erected for a small number of species which are brownish in color and with the forewings having the venation

in strong relief. Separation of these species has some morphological foundation (the median length of the crown of the head also exceeds the transocular width), but other characters are those of typical *Diestostemma*. *Chiapasa* Schmidt is based on a series of nymphs (quite possibly specifically misdetermined) with their knifelike (deciduous) process from the apex of the head. Signoret (1855c, pl. 21, fig. 18) provided evidence that this character properly belongs to *Diestostemma*.

The abdominal sternum VII of the holotype of *Diestostemma steinbachi* Schmidt, of which only the type has been seen, is like the illustration of the same structure in *D. schmidti* Melichar.

A male specimen (ZIMH) bearing labels: "Kotypus" and "Mexico/ Hrm. & Hans Kulow lg./ded. 6 VII. 1900/Socunusco; (Chiapas)/ 1120 m. über Meer" is here designated lectotype of *Diestostemma multipunctatum* Melichar.

No specimens of *Diestostemma brunneum* Melichar or *D. cuspidatum* (Signoret) have been seen by the writer. Of *D. nervosum* (Signoret), only two specimens so determined were seen, in Stockholm, but there was no indication that Signoret had ever seen them nor any assurance that they were accurately identified. *D. nigropunctatum* (Signoret) is known only from the female lectotype.

The lectotype female of *Diestostemma niveum* Melichar has lateral lobes on the posterior margin of abdominal sternum VII more fully developed than the specimen illustrated in figure 8.

The interpretation of *D. ptolyca* Distant rests on a male specimen compared externally with the teneral lectotype, by the writer.

Diestostemma rubriventris (Schmidt) is known only from the female lectotype, of which the abdominal sternum VII is badly damaged, and is not illustrated.

My interpretation of *Diestostemma limbatipenne* Schmidt is based on a topotypic male compared with the female lectotype, which I dissected. *D. biolleyi* Distant, as here interpreted, is based on a male compared externally with the lectotype male.

SPECIES OF DIESTOSTEMMA

[† Only females studied. § No specimens studied.]

albipenne (Fabricius), 1803a:62 (*Cicada*). Trinidad Is., Br. Guiana, D. Guiana, Brazil.

†*atropunctulatum* (Melichar), 1924e:211 (*Leucopepla*). Fr. Guiana, Brazil. New combination.

biolleyi Distant, 1908b:81. Mexico, Costa Rica.

ruforeticulatum Schmidt, 1910a:47. New synonymy.

bituberculatum (Signoret), 1855c:528 (*Tettigonia*). Br. Guiana, Fr. Guiana, Brazil.

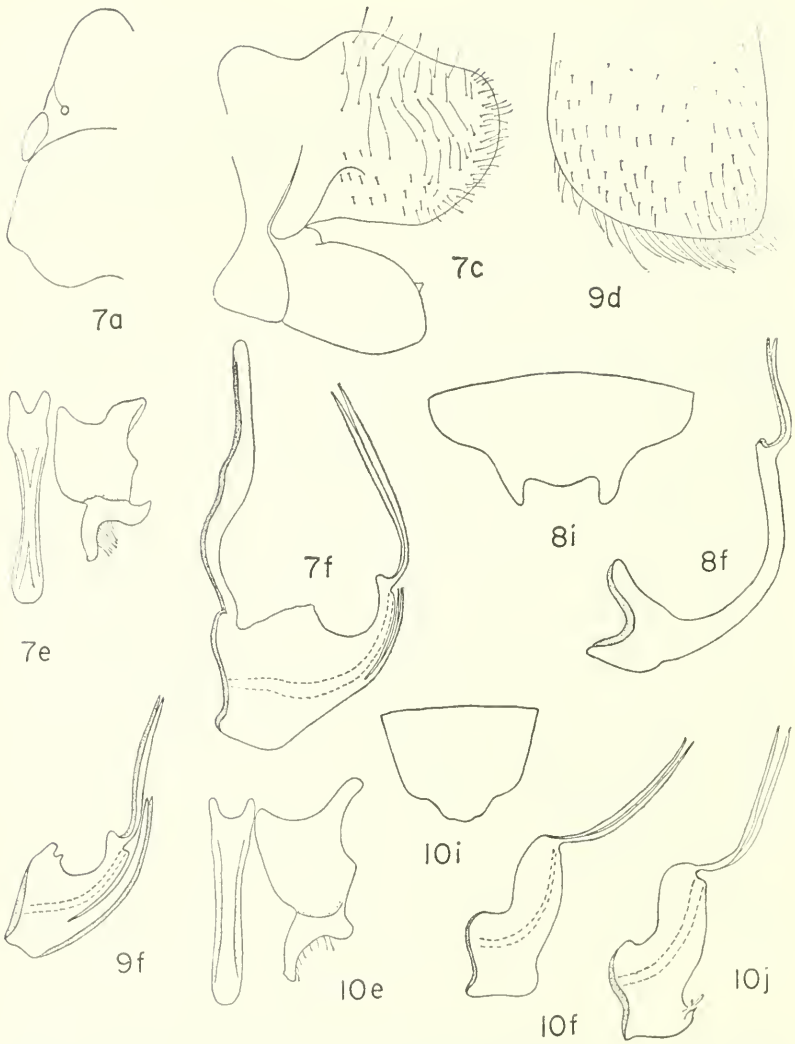
blantoni, new species. Panama, Br. Honduras, Ecuador, Peru.

§*brunneum* Melichar, 1924a:226.
chinai, new species. Br. Honduras.
colombiae, new species. Colombia.
§*cuspidatum* (Signoret), 1855c:525 (*Tettigonia*).
diommonotum Schmidt, 1910a:53. Mexico, Costa Rica, Panama.
multipunctatum Melichar, 1924a:224. New synonymy.
dolosum (Melichar), 1924a:229 (*Heterostemma*). Ecuador, Peru, Bolivia. New combination.
dubium, new species. Brazil.
†*excisum* Schmidt, 1910a:46. Ecuador.
huallagana, new species. Peru.
intermedium, new species. "Amazonas."
†*morosum* (Melichar), 1924a:229 (*Heterostemma*). Bolivia. New combination.
nasutum Schmidt, 1910a:58. Ecuador.
§*nervosum* (Signoret), 1855c:524 (*Tettigonia*).
nigropunctatum (Signoret), 1855c:527 (*Tettigonia*). Mexico.
niveum Melichar, 1924a:216. Colombia, Venezuela.
parvum Schmidt, 1910a:55. Ecuador.
ptolyca Distant, 1908b:82. SE. Brazil, Paraguay.
pistor Schmidt, 1910a:50. New synonymy.
limatum Melichar, 1924a:223. New synonymy.
reticulatum (Melichar), 1924a:212 (*Leucopepla*). Peru. New combination.
rizopatroni, new species. Peru, Bolivia.
†*rubriventris* (Schmidt), 1928a:37 (*Leucopepla*). Peru. New combination.
rufocirculum Schmidt, 1910a:43. Venezuela, Colombia, Brazil.
rugicolle (Signoret), 1855c:525 (*Tettigonia*). Mexico.
schmidti Melichar, 1924a:222. Costa Rica.
†*steinbachi* Schmidt, 1910a:56. Bolivia.
stesilea Distant, 1908b:83. Venezuela, Colombia, Peru, Bolivia.
lacteoguttatum Schmidt, 1910a:42. New synonymy.
limbatipenne Schmidt, 1910a:44. New synonymy.
thoracis, new species. Guatemala, Br. Honduras, Honduras, Mexico.
truncatipenne Schmidt, 1911b:292. Peru.

KEY TO MALES OF DIESTOSTEMMA

Not included: *atropunctulatum* (Melichar) (fig. 24), *brunneum* Melichar, *cuspidatum* (Signoret), *excisum* Schmidt (fig. 14), *morosum* (Melichar) (fig. 11), *nervosum* (Signoret), *nigropunctatum* (Signoret) (fig. 23), *rubriventris* (Schmidt), and *steinbachi* Schmidt.

1. Aedeagal shaft with paired apical processes which are half length of shaft 2
   Aedeagal shaft with apical processes much shorter or absent . . 4
2. Aedeagal shaft with paired ventral processes arising near mid-length . . . . . **D. albipenne** (Fabricius) (fig. 7)
   Aedeagal shaft without processes or with processes arising basiventrally 3

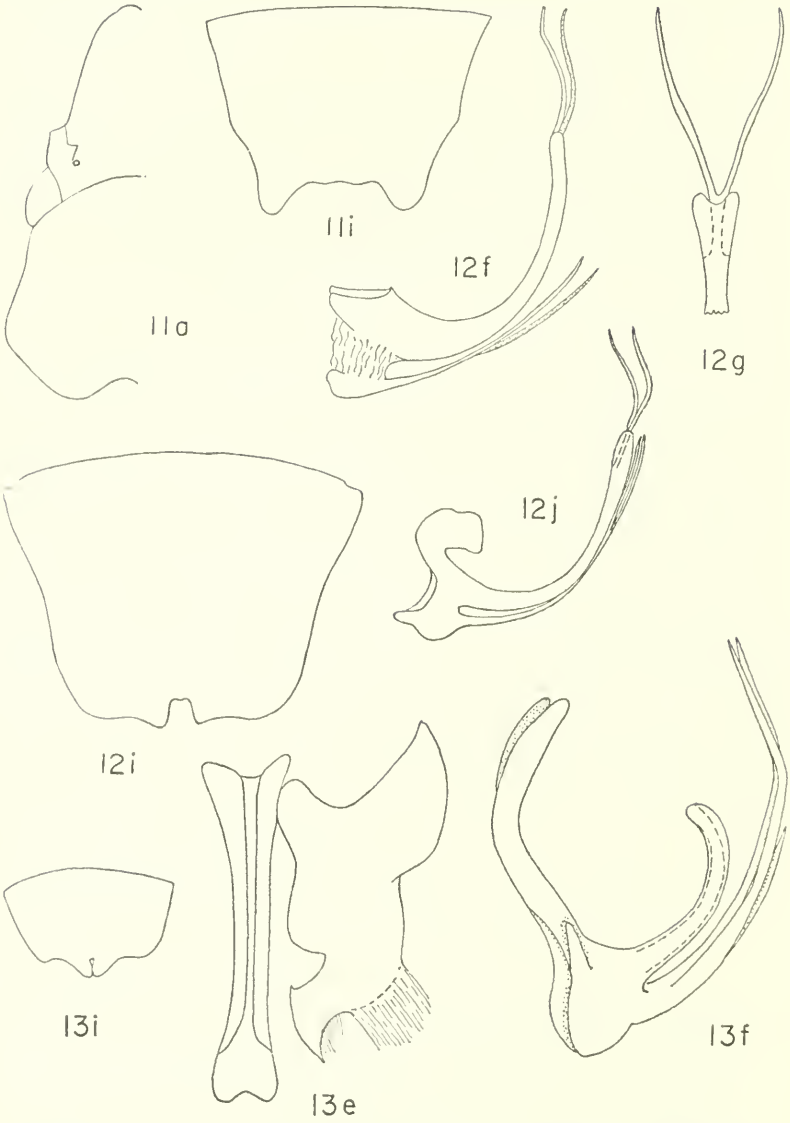


FIGURES 7–10.—7, *Diestostemma albipenne* (Fabricius), specimen from French Guiana. 8, *D. niveum* Melichar: f from specimen from Colombia, i, from Venezuela. 9, *D. dubium*, new species, holotype. 10, *D. huallagana*, new species (e, i, f, from holotype): j, aedeagus, lateral aspect, specimen from Tingo María, Peru.

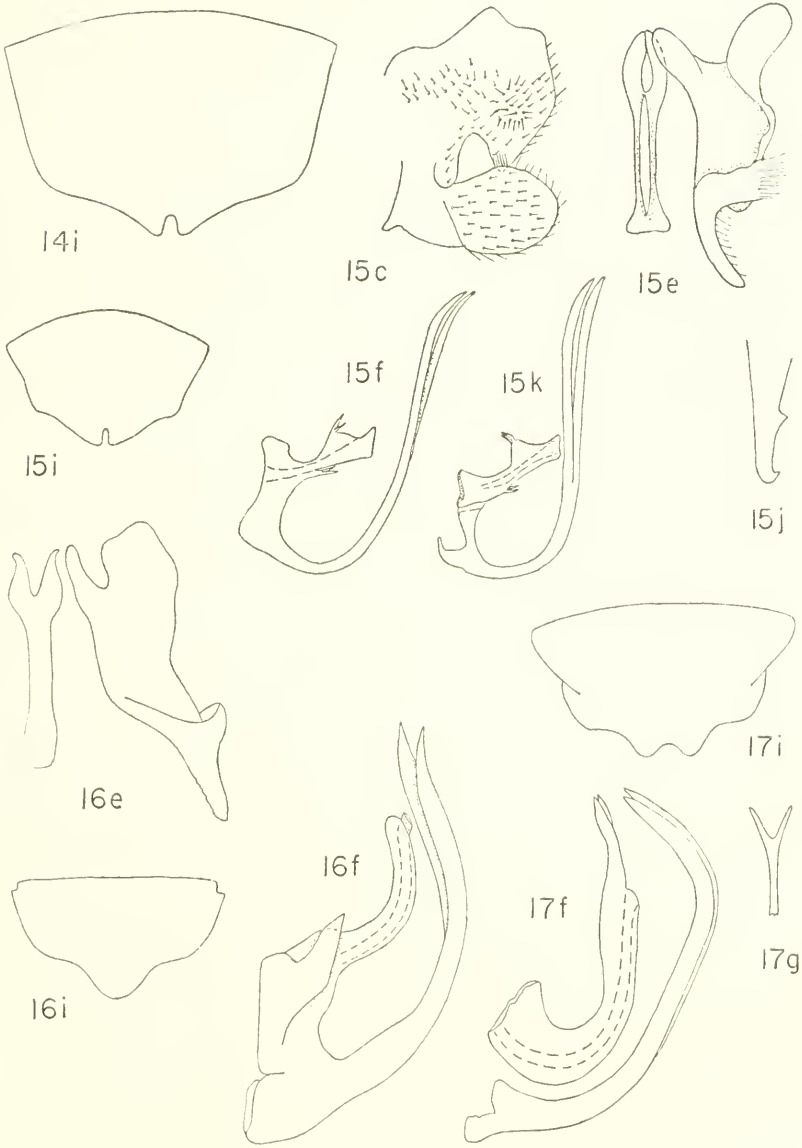
3. Aedeagus with basiventral processes exceeding apex of shaft. **D. dubium**, new species (p. 44)

Aedeagus without processes or with rudimentary basiventral processes. . . . . **D. huallagana**, new species (p. 44)

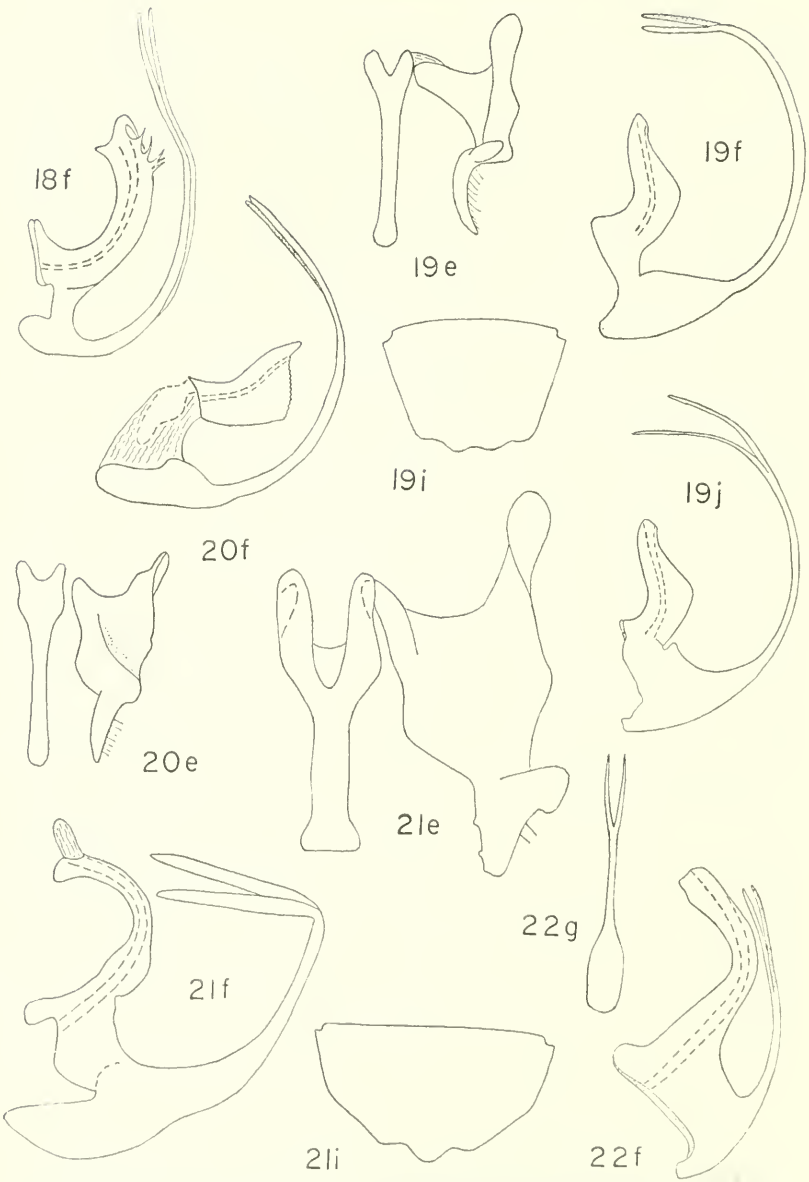
4. Large species with costal and apical margins of forewings bordered with reddish brown . . . . . **D. niveum** Melichar (fig. 8)
   Not as above 5
5. Species orange hued, forewing reticulate veined (known only from Mexico and Costa Rica) . . **D. biolleyi** Distant (fig. 12)
   Species chalky white or sordid brown, occasionally marked with red, forewings with or without a conspicuous plexus of veins (distribution varied, including Mexico and Costa Rica) . . . 6
6. Aedeagus with three ventral processes arising at base.
   D. rizopatroni, new species (p. 45)
   Aedeagus not so 7
7. Aedeagal shaft very short with paired dorsal and ventral processes.
   D. stesilea Distant (fig. 15)
   Aedeagal shaft not so 8
8. Aedeagal shaft with a short, angular process on each side at base . . . . . **D. ptolyca** Distant (fig. 16)
   Aedeagal shaft not so 9
9. Aedeagal shaft with an apical Y-shaped process.
   D. diommonotum Schmidt (fig. 17)
   Aedeagal shaft not so 10
10. Aedeagal shaft with a number of ventral processes in apical fourth . . . . . **D. colombiae,** new species (p. 42)
    Aedeagal shaft not so 11
11. Aedeagal shaft with three apical processes 21
    Aedeagal shaft not so 12
12. Aedeagal shaft in lateral aspect abruptly narrowed in apical half.
    D. blantoni, new species (p. 42)
    Aedeagal shaft not or very gradually narrowed in apical half . 13
13. Aedeagal shaft short, with a slight apical projection from dorsal margin of broadly truncate apex.
    D. chinai, new species (p. 43)
    Aedeagal shaft not as above 14
14. Aedeagus with basiventral process bifurcate, abruptly curved cephalad anteapically . **D. bituberculatum** (Signoret) (fig. 21)
    Aedeagus with basiventral process(es) or paraphyses not abruptly curved cephalad anteapically 15
15. Aedeagus with ventral process(es) not extending posterodorsally farther than apex of shaft 16
    Aedeagus with ventral processes extending posterodorsally farther than apex of shaft 17
16. Aedeagus with ventral process branched before apex.
    D. rugicolle (Signoret) (fig. 22)
    Aedeagus with ventral process single, unbranched.
    D. thoracis, new species (p. 45)



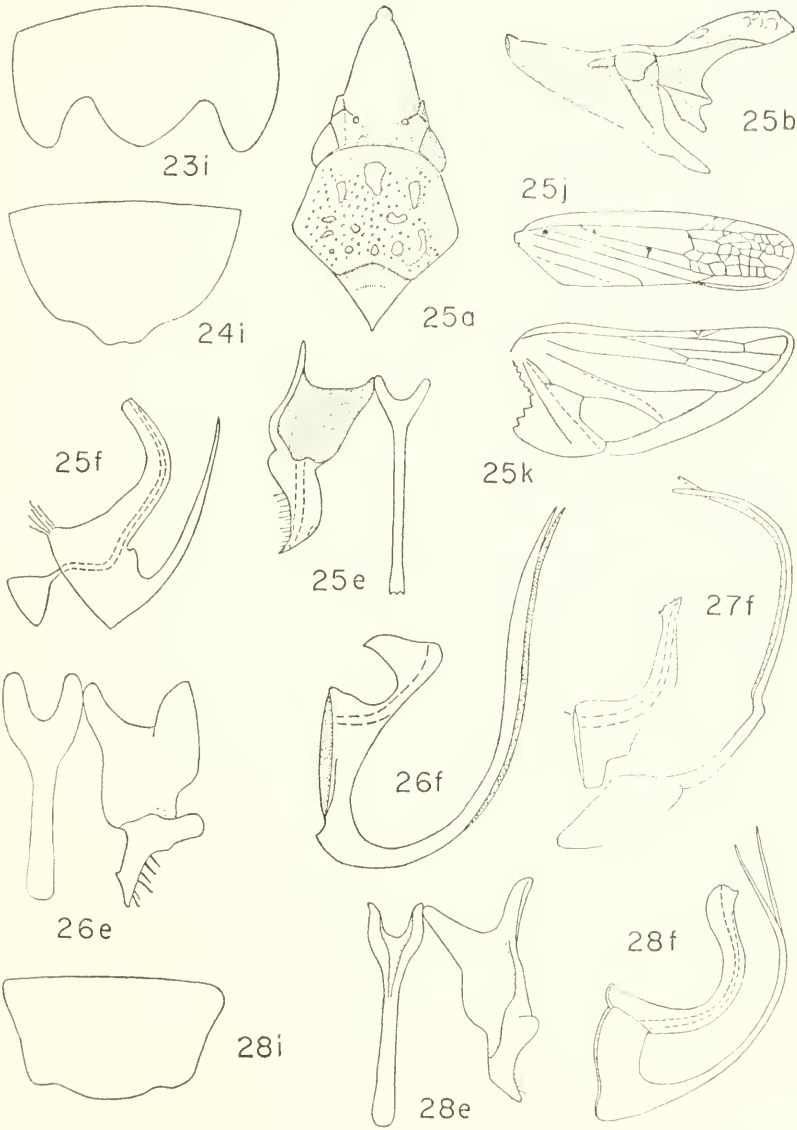
FIGURES 11–13.—**11,** *Diestostemma morosum* (Melichar), lectotype. **12,** *D. biolleyi* Distant, specimens from Costa Rica: **j,** atypical variation in aedeagus. **13,** *D. rizopatroni*, new species: **e** and **f** from holotype, **i** from specimen from La Merced, Peru.



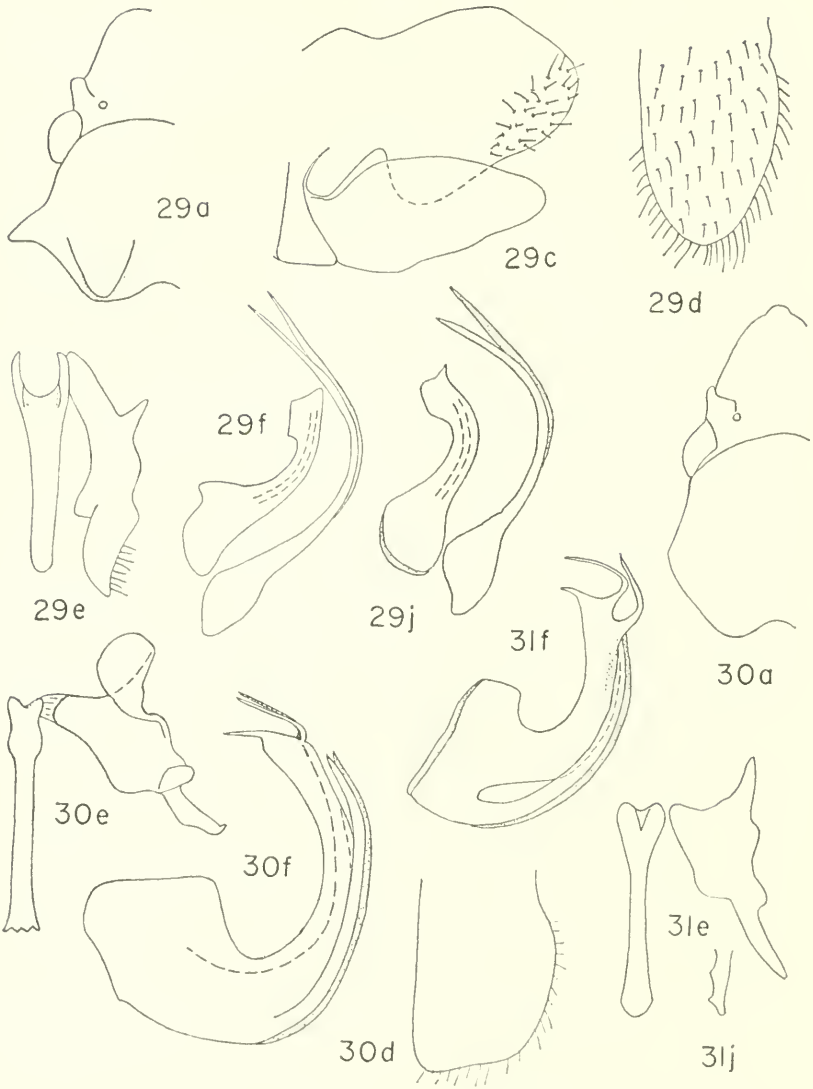
FIGURES 14–17.—**14,** *Diestostemma excisum* Schmidt, lectotype. **15,** *D. stesilea* Distant (**c, e, f, j** from specimens from Tingo María, Peru; **i,** from Colombia): **j,** style apex, lateral view; **k,** atypical aedeagus from Callanga, Peru. **16,** *D. ptolyca* Distant, specimens from Santa Catarina, Brazil. **17,** *D. diommonotum* Schmidt (**f** and **g** from specimen from Panama; **i,** from Chiapas, Mexico): **g,** aedeagal apex, caudal view.



FIGURES 18–22.—**18,** *Diestostemma colombiae*, new species, holotype. **19,** *D. blantoni*, new species: **e** and **f** from topotype; **i** and **j** from specimens from Tingo María, Peru. **20,** *D. chinai*, new species, holotype. **21,** *D. bituberculatum* (Signoret), male specimen from French Guiana, female from British Guiana. **22,** *D. rugicolle* (Signoret): **f** from lectotype, **g** from specimen from Honduras.



FIGURES 23–28.—23, *Diestostemma nigropunctatum* Signoret, lectotype. 24, *D. atropunctulatum* (Melichar), lectotype. 25, *D. thoracis*, new species, specimen from Honduras: j, forewing; k, hindwing. 26. *D. rufocirculum* Schmidt, specimen from Venezuela. 27, *D. parvum* Schmidt, lectotype. 28, *D. schmidti* Melichar, specimens from Costa Rica: i from "cotype," from Piedras Negras, Costa Rica.



FIGURES 29–31.—**29,** *Diestostemma reticulatum* Melichar (**a** and **j** from specimen from Cuzco, Peru, others from lectotype): **j,** aedeagus and paraphyses, lateral aspect. **30,** *D. truncatipenne* Schmidt, specimen from Tingo María, Peru. **31,** *D. intermedium*, new species, holotype: **j,** style apex, lateral aspect.

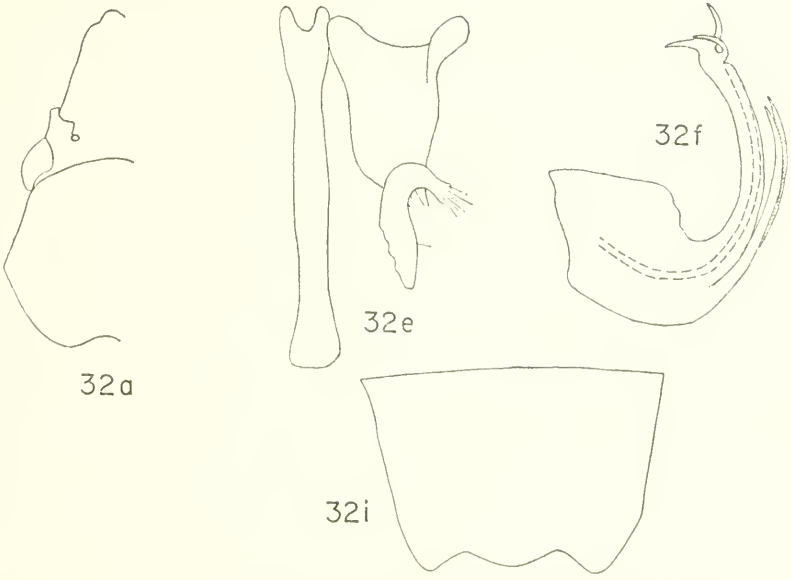


FIGURE 32.—*Diestostemma dolosum* Melichar, specimens from Cuzco, Peru.

17. Paraphyses slightly elbowed before midlength in lateral aspect.
D. parvum Schmidt (fig. 27)
Paraphyses or ventral aedeagal processes not so. 18
18. Aedeagal shaft with dorsal margin U-shaped.
D. rufocirculum Schmidt (fig. 26)
Aedeagal shaft with dorsal margin more broadly concave . . . 19
19. Forewing with conspicuous brown vermiculations; pronotum with paired conical elevations . . **D. reticulatum** Melichar (fig. 29)
With neither of above characters. 20
20. Connective extending farther posteriorly than styles (Costa Rica).
D. schmidti Melichar (fig. 28)
Connective not extending as far posteriorly as styles (Ecuador).
D. nasutum Schmidt
21. Aedeagal shaft with a pair of apical processes, in addition to an anteriorly directed process, aedeagus symmetrical.
D. truncatipenne Schmidt (fig. 30)
Aedeagal shaft with two caudal processes arising serially, in addition to anteriorly directed process, aedeagus asymmetrical. . 22

22. Species more robust; forewings whitish, crown with median length much less than transocular width; ventral processes of aedeagus arising at base of shaft.

D. intermedium, new species (p. 46)

Species more slender; forewings brownish, crown with median length approximately equal to transocular width; ventral processes of aedeagus arising near midlength of shaft.

D. dolosum (Melichar) (fig. 32)

Diestostemma colombiae, *new species*

FIGURE 18

Length of male 20 mm.; of female 21 mm. Head with median length of crown less than transocular width, crown without a median fovea, with very short pubescence, antennal ledges not foveate, clypeus with a shallow median depression. Pronotum of male as in *D. blantoni*, new species (see below), of female with few small coarse rugae on disc and with a pair of slight elevations near humeral margins, scutellum not transversely striate. Forewings opaque, with a network of veins in corium, including apical portion of basal half. Male pygofer not deeply emarginate basally; plates not extending as far posteriorly as pygofer apex; style extending about as far posteriorly as connective, apical portion curved slightly laterad, with a slight angular anteapical lateral projection, apex truncate; connective linear, aedeagus with shaft slightly broadened beyond middle in lateral aspect, with a short angular dorsal anteapical projection, a number of spinelike ventral anteapical projections some of which are branched, an apical process which is decurved and parallel to ventral margin of shaft, and an elongate stalked pair of ventral processes arising at base of shaft, curving posteriorly and dorsally and extending beyond apex of shaft. Female abdominal sternum VII with posterior margin produced in a convex lobe which is excised medially.

Holotype male, "Buonavista, Ost Cord, 1200 m." (MMB); and one female, Zamora, Colombia (MHNP). The type specimen had been determined as *Diestostemma limbatipenne* Schmidt, by Melichar.

D. colombiae is quite distinct from all other species of *Diestostemma* in the bizarre form of the aedeagus.

Diestostemma blantoni, *new species*

FIGURE 19

Length of male 17–18.5 mm.; of female 18–19.5 mm. Head with median length of crown less than transocular width, crown without

a median fovea, without pubescence, antennal ledges not fovcate, clypeus flattened or very slightly depressed medially. Pronotum without conspicuous coarse rugae, scutellum minutely, transversely striate on posterior half. Forewings opaque, without a network of veins in clavus and basal half of corium. Male pygofer deeply emarginate basiventrally; plates not extending as far posteriorly as pygofer apex; style extending about as far posteriorly as connective, apex curved slightly laterad, rounded at tip; connective Y-shaped; aedeagus with shaft short, widest at midlength, ventral margin slightly concave in apical half, without processes other than long ventral processes which arise basiventrally, extend in an arc posterodorsally, greatly exceeding apex of shaft, and are fused through more than the basal half their length. Female abdominal sternum VII with posterior margin produced only slightly more at middle than laterally, slightly concave medially, the posterior margin appearing sinuate. Crown, pronotum, and scutellum dull yellow, with indistinct dull brownish submarginal bands along lateral pronotal margins. Forewings opaque white, with a few black points in corium.

Holotype male with label "F 33031912; Barro Colorado C.Z./ III 18 1933" (AMNH). A number of additional specimens of both sexes have been examined from the Panama Canal Zone; British Honduras; Ecuador; and from Callanga and Tingo María, Peru.

This species is named in honor of Dr. F. S. Blanton whose collecting activities in Panama have done much to increase our knowledge of the fauna of Central America.

Diestostemma chinai, *new species*

FIGURE 20

Length of male 18.5 mm.; of female 20 mm. Head with clypeus slightly depressed medially. Male with style not curved apically; aedeagal shaft short, broad, truncate apically but with dorsal portion of apical margin produced slightly posteriorly. Female abdominal sternum VII as in *D. schmidti* Melichar but longer. Other structural characters as in *D. blantoni*, new species. Color as in *blantoni*, but with lateral pronotal brown markings extending onto head along inner margin of each eye and including the antennal ledges, the lateral pronotal coloration in some specimens joined in basal half of pronotum by a concolorous transverse band and joined along posterior pronotal margin delimiting a circular median pronotal yellow spot; forewings with a few black points in basal half of corium and an oblique black line near midlength of corium.

Holotype male, Punta Gorda, British Honduras, September 1933 (J. J. White); an additional pair and a specimen with abdomen missing, also from British Honduras (BM). This species is named in honor of Dr. W. E. China, former Keeper of Insects in the British Museum (Natural History), who assisted the writer in many ways during the studies leading to this publication.

This species is closely related to *D. blantoni*, new species, and to *D. schmidti* Melichar, from both of which it can be separated by the characters set forth in the keys and in the above description.

Diestostemma huallagana, *new species*

FIGURE 10

Length of male 15–16 mm.; of female 16.5–17.5 mm. Head with median length of crown usually exceeding transocular width. Scutellum not striate on posterior half. Male with styles not extending as far posteriorly as connective, each with a slight anteapical point on mesal margin; aedeagus short, fairly broad, with pair of apical processes extending posterodorsally, nearly as long as shaft, ventral margin with a rounded swelling at base which may or may not (type) bear a few small processes. Female abdominal sternum VII with posterior margin produced posteriorly in a convex lobe. Other structural characters as in *D. blantoni*, new species. Crown, pronotum, and scutellum dull yellow, pronotum with castaneous markings arranged to delimit three small yellow spots near anterior margin and a much larger yellow spot on disc; forewing opaque white with a few variable linear black markings.

Holotype male, Huallaga River Valley, altitude 500 m. (F. Woytkowski), from NCS on indefinite loan to USNM; five topotypes of both sexes (NCS). Additional specimens have been examined from Tingo María, Cuzco, Puerto Maldonaldo, and Río Santiago, Peru, most of them from Tingo María.

This species is closely related to *D. albipenne* (Fabricius) from which it differs chiefly in the form of the aedeagus which has much longer ventral processes arising beyond the midlength of the shaft.

Diestostemma dubium, *new species*

FIGURE 9

Length of male 18 mm. Head with median length of crown much less than transocular width; ocelli each much closer to adjacent anterior eye angle than to median line. Pronotum with a few small

callosities. Other external characters as in *D. blantoni*, new species. Male genitalia as in *D. huallagana*, new species, but with basiventral aedeagal processes elongate, exceeding apex of shaft, and with a pair of dentiform dorsal processes at base of aedeagus.

Holotype male, Taracua, Amazonas (RMS), and a pair of specimens, Cuyabá, Mato Grosso, Brazil (IZP).

This species is related to *D. huallagana*, new species, and *D. albipenne* (Fabricius), from both of which it can be distinguished most readily by the structure of the aedeagus (see figs. 10 and 7).

Diestostemma rizopatroni, *new species*

FIGURE 13

Length of male 16 mm.; of female 20 mm. Head with clypeus slightly depressed medially. Forewings of female with a few supernumerary cross veins in base of corium and in adjacent clavus. Male with pygofer not emarginate basally; style not extending as far posteriorly as apex of connective, acute at apex, with an anteapical mesal angle; connective linear, slightly broadened at base; aedeagus with a pair of elongate ventral processes and an unpaired shorter ventral process all arising at base, shaft without more distal processes, curving smoothly posterodorsally, rounded apically, atrium with a pair of lateral short acute processes. Female abdominal sternum VII with a very narrow apical excision bordered by a pair of lobes which are convergent and contiguous at apex. Other structural characters as in *D. blantoni*, new species. Color of crown, pronotum, and scutellum sordid yellow; forewings opaque white with a few linear darker markings.

Holotype male and one female specimen, Chanchamayo, Peru (USNM); and three specimens "Prov. Sara," Bolivia (IZP).

The species is named in honor of Captain Rizo-Patrón, who was most hospitable to the writer during a collecting trip to the Chanchamayo Valley in 1960. The species is quite distinct from other species of the genus in the aedeagal processes and the form of the style.

Diestostemma thoracis, *new species*

FIGURE 25

Length of male 14–15 mm.; of female 17.5 mm. Head with median length of crown exceeding transocular width, antennal ledges with fovea not extending full length, face flattened medially. Pronotum without gross elevations from dorsal surface, but with a number of slightly elevated callosities between which the surface is coarsely

punctate. Male pygofer not emarginate basiventrally; style not extending posteriorly as far as apex of connective, acute at apex; connective Y-shaped with arms very short; aedeagus with shaft curved smoothly posterodorsally, gradually tapered, rounded at apex, with a basal unpaired tapering acute process extending almost as far posteriorly as aedeagal shaft and curved very slightly dorsally. Female abdominal sternum VII with posterior margin as in *D. schmidti* Melichar. Other structural characters as in *D. blantoni*, new species. Color of crown, pronotum, and scutellum dull brownish yellow, the pronotal callosities orange, forewings opaque white with a few black dots.

Holotype male and a pair of additional specimens, Morales, Guatemala (NCS), the type on indefinite loan to USNM; one male, British Honduras (NCS); one male, Honduras, and a female, Vera Cruz, Mexico (USNM); one female, Chiapas, Mexico (IZP).

This species is closely related to *D. rugicolle* (Signoret), from which it differs in the unbranched ventral aedeagal process.

Diestostemma intermedium, *new species*

FIGURE 31

Length of male 17 mm. Head with median length of crown less than transocular width, antennal ledges with very shallow fovea extending full-length, clypeus depressed medially. Pronotum without gross elevations from surface, without callosities, disc coarsely punctate. Forewings with supernumerary crossveins in clavus. Male genitalia as in *D. dolosum* Melichar (fig. 32) but with apical aedeagal processes longer and more slender, ventral processes arising at base instead of near midlength. Color of crown and pronotum greenish yellow, of scutellum and forewings chalky.

Holotype male, "Amazonas" (RMS).

This species is related to *D. dolosum* (Melichar), from which it differs in the characters specified in the description.

4. *Genus* HOMOSCARTA Melichar

FIGURES 33–36

Homoscarta Melichar, 1926a:278. Type-species: *Tettigonia irregularis* Signoret, by original designation.

Length 16.0–22.0 mm.

Head moderately produced with anterior margin rounded in dorsal aspect, apex not or weakly carinate at transition from crown to face, ocelli located on or slightly behind a line between anterior eye angles,

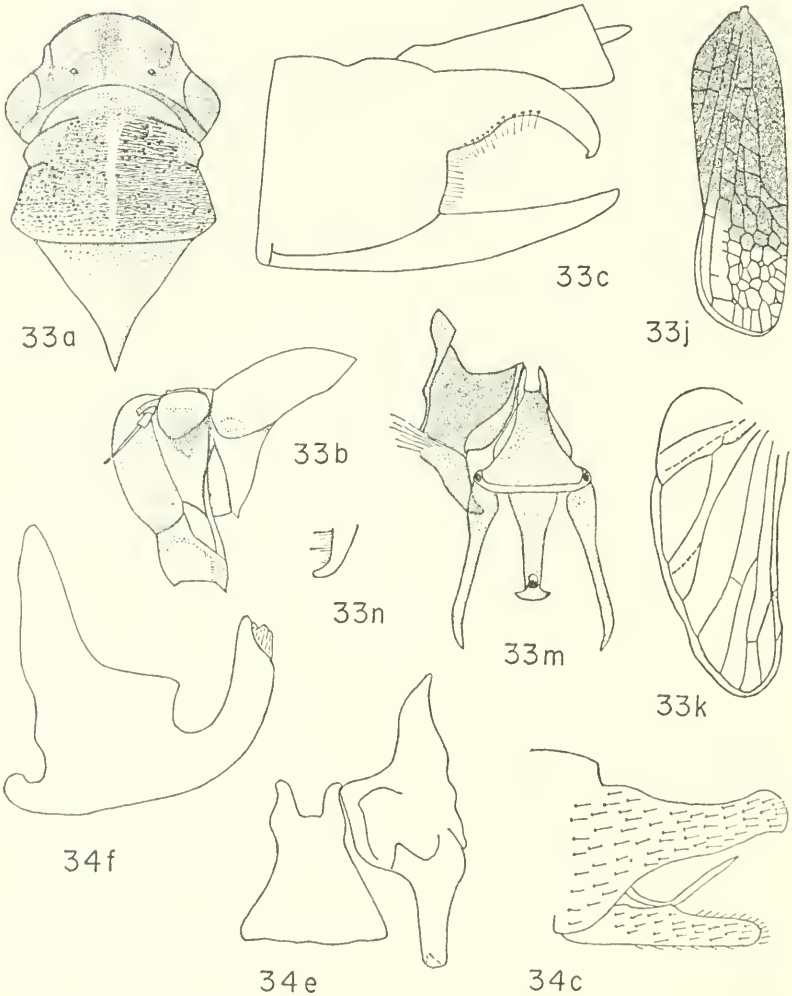
each slightly closer to median line of crown than to adjacent anterior eye angle; without a distinct median M-shaped elevation bordering posterior margin, with a slight longitudinal elevation laterad of each ocellus; coronal portion of muscle impressions elevated each side of median fovea which extends almost to posterior margin of head; antennal ledges elevated, with a longitudinal fovea, in lateral aspect carinate dorsally and with anterior edges abruptly declivous; clypeus depressed on disc, with muscle impressions distinct on each side; lower portion of face strongly pubescent; clypellus strongly angular in lateral aspect, laterally compressed.

Thorax with pronotal width about equal to transocular width of head, lateral margins convergent anteriorly, with a very nearly complete transverse sulcus behind and near anterior margin and with a second transverse sulcus on each side near the first, posterior margin convex or concave, dorsopleural carinae incomplete and oblique, or complete and arcuate; scutellum transversely striate in posterior half. Forewing coriaceous, without a membrane; veins elevated and distinct, surface with a number of rather large depressions each containing a white bloom, often punctate, often with short pubescence; with more than four very short apical cells; corium with a broad anteapical plexus of veins, with supernumerary anteapical crossveins to costal margin; forewings of female, at rest, not attaining apex of ovipositor. Hindwing with apex extending almost to apex of forewing, vein R_{2+3} entire. Hindlegs with femoral setal formula 2:0:0; first tarsomere shorter than combined length of second and third.

Male genitalia: Pygofer in lateral aspect well-produced posteriorly and narrowed to varying degrees, with microsetae variously distributed, without processes. Plates fused through greater part of length, extending as far posteriorly as pygofer apex or not, gradually narrowed to fairly broadly rounded apices. Styles extending posteriorly beyond apex of connective, each with preapical lobe and rounded apically. Connective Y-shaped with arms not widely divergent and stem broadly expanded posteriorly, without a keel. Aedeagus fairly slender, curved gradually dorsally, symmetrical with a lateral anteapical expansion on each side, Paraphyses present, very closely associated basally with posterolateral angles of connective, slender, each gradually tapered to acute apex.

Female abdominal sternum VII with a very slight median heavily sclerotized angular projection.

Homoscarta is primitive in a number of characteristics: the large size, the produced clypellus, the plexus and the large number of apical cells of the forewings, the entire R_{2+3} of the hindwings, the short posterior femora, and the posterior femoral setal formula. The paraphyses arise

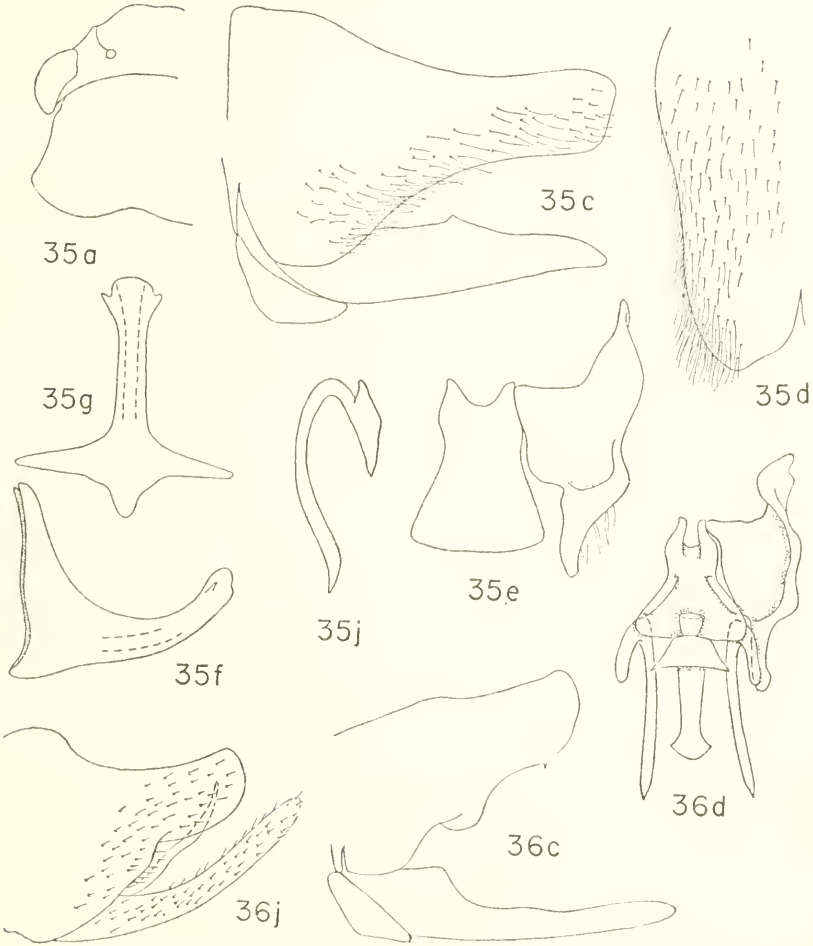


FIGURES 33, 34.—33, *Homoscarta irregularis* (Signoret): **j**, forewing; **k**, hindwing; **m**, one style, connective, aedeagus, and paraphyses, dorsal view; **n**, apex of style, lateral view. 34, *H. superciliaris* (Jacobi), specimen from Cuzco, Peru; process shown in **c** is a paraphysis.

in a position from which several other conditions found in the subfamily could have been derived. The males are larger than the females.

Species of *Homoscarta* are known from Ecuador, Peru, Bolivia, and Brazil. The species are very similar externally. Only the males can be identified.

No specimens eligible to be lectotype of *H. irregularis* (Signoret) were found in the Signoret collection in Vienna (NMV) and none were sent



FIGURES 35, 36.—**35,** *Homoscarta boliviana* Schmidt, specimen from El Palmar, Bolivia: **j,** one paraphysis, dorsal view. **36,** *H. ecuadoriana* Schmidt (**c** from lectotype, setae not shown; **d** from specimen from Macas, Oriente, Ecuador, dorsal view): **j,** pygofer, plate, and paraphysis of same specimen as in **d.**

from Berlin. The interpretation of the species here is believed to be the same as that of Melichar (1926a:278). The genitalia of the lectotype of *H. ofella* (Distant) agree with the illustrations of *H. irregularis* in figure 33.

The lectotypes of *H. superciliaris* (Jacobi) and *H. boliviana* Schmidt agree with figures 34 and 35, respectively. The lectotype of *H. ecuadoriana* Schmidt has genitalia like those of *H. boliviana* Schmidt, except as illustrated in figure 36.

SPECIES OF HOMOSCARTA

[*Type not seen.]

boliviana Schmidt, 1928a:46. Peru, Bolivia, Brazil.
ecuadoriana Schmidt, 1928a:46. Ecuador.
**irregularis* (Signoret), 1855b:232 (*Tettigonia*). Peru, Bolivia, Brazil.
ofella, *Amblydisca* Distant, 1908b:71. New synonymy.
superciliaris (Jacobi), 1905c:165 (*Amblydisca*). Peru, Bolivia.

KEY TO MALES OF HOMOSCARTA

1. Pygofer gradually decurved in lateral aspect, acute apically
H. irregularis (Signoret) (fig. 33)
Pygofer not so. 2
2. Male plates not extending as far posteriorly as pygofer apex.
H. superciliaris (Jacobi) (fig. 34)
Male plates exceeding pygofer apex posteriorly. 3
3. Larger insects, darker in color, pygofer truncate apically.
H. boliviana Schmidt (fig. 35)
Smaller, paler insects, pygofer convex apically.
H. ecuadoriana Schmidt (fig. 36)

5. *Genus* DICTYODISCA Schmidt

FIGURE 37

Dictyodisca Schmidt, 1928a:50. Type-species: *Amblydisca salvini* Fowler (1898a:209), by original designation and monotypy.

Length 17–18 mm.

Head slightly produced and broadly rounded in dorsal aspect, length less than half interocular width, apex slightly elevated and carinate, ocelli on a line between anterior angles of eyes and each equidistant between adjacent eye angle and midline, disc with a broad shallow median fovea, with a short longitudinal keel laterad of each ocellus; antennal ledges foveate, not carinate dorsally, anterior edges declivous; clypeus with muscle impressions distinct; disc depressed; face finely pubescent; clypellus produced, contour of its lower portion at right angle to profile of clypeus, with a median carina.

Thorax with pronotal width greater than transocular width of head, lateral margins convergent anteriorly, disc transversely rugose and punctate, with dorsopleural carinae complete; scutellum transversely rugose on posterior half. Forewing with membrane, veins distinct apically but obscure basally, surface coriaceous and punctate basad of membrane, with considerably more than four apical cells; corium with an anteapical plexus of veins and with anteapical super-

numerary crossveins to costal margin. Hindwing as in *Homoscarta*. Hindlegs as in *Homoscarta*.

Male genitalia: Pygofer short, obliquely truncate apically, with microsetae on and near ventral margin, without processes. Plates fused nearly throughout length, extending much farther posteriorly than pygofer apex, with numerous dispersed microsetae. Style extending farther posteriorly than connective, without preapical lobe, scarcely modified apically, with a number of irregularly arranged microsetae. Connective Y-shaped, stem broadened apically. Aedeagus slender, symmetrical, with a pair of dorsal apical processes, genital orifice terminal. Paraphyses absent.

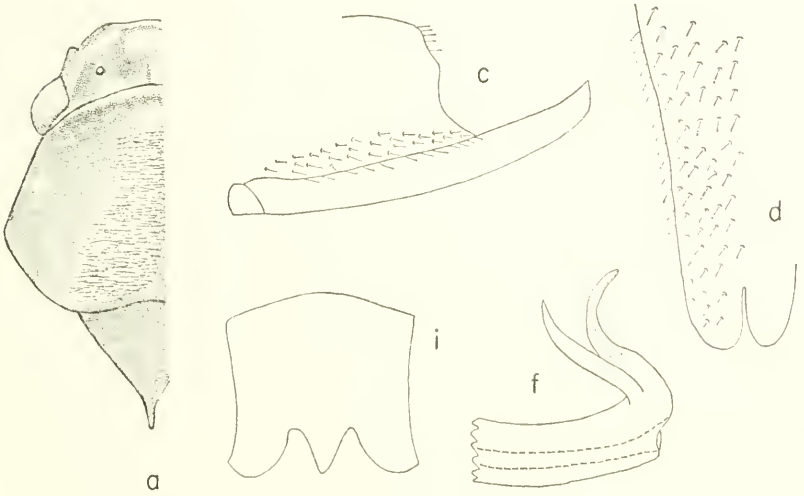
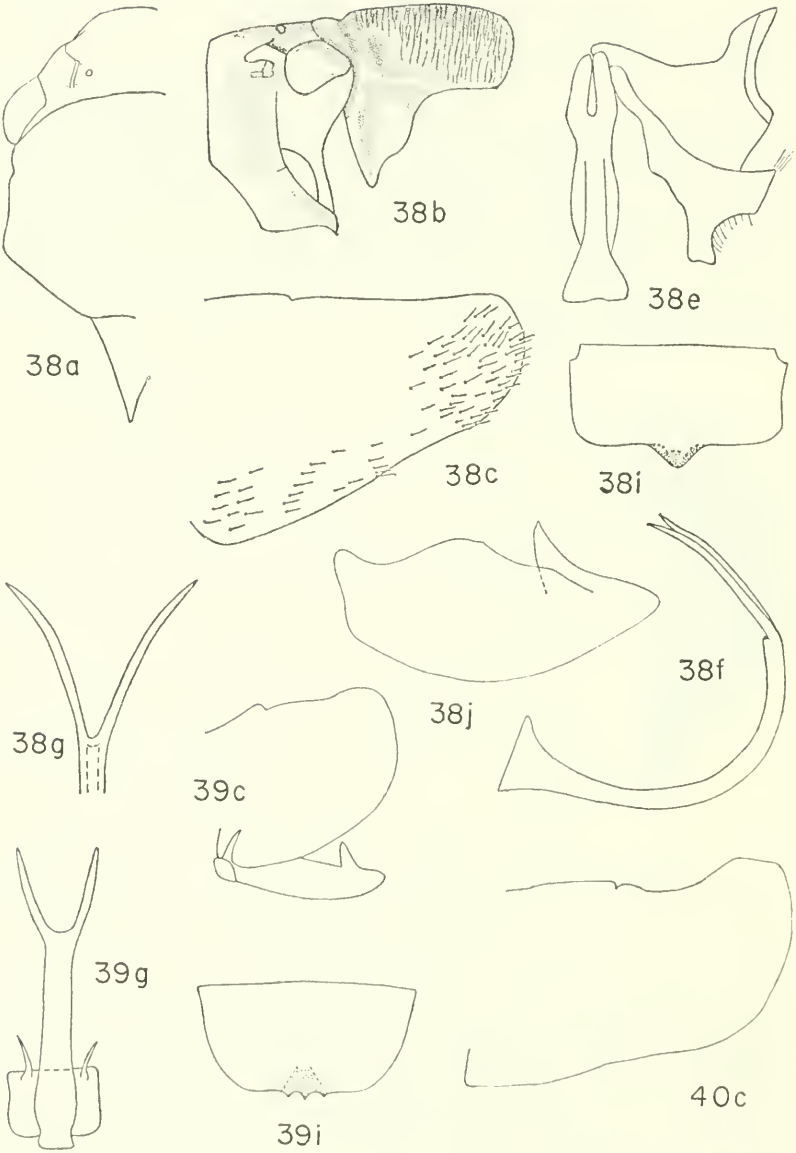


FIGURE 37.—*Dictyodisca salvini* (Fowler): **f**, apical portion only of aedeagus.

Female abdominal sternum VII excavated each side of a median triangular posterior projection.

Dictyodisca is known only from the type-species, of which only eleven specimens are known. The observations of the male genitalia were made from a teneral specimen in the British Museum (Natural History). The abdomen had been glued on this specimen, and the anterior dorsum was slightly damaged.

Dictyodisca is known only from Panama and Costa Rica. It is related to *Homoscarta*, but differs by the characters mentioned in the key and in that the posterior tibial setae of rows 1 and 2 are sparse, short, and stout, whereas in *Homoscarta* they are more closely set and more slender.



FIGURES 38–40.—38, *Stictoscarta sulcicollis* (Germar) (a from specimen from Brazil; b, c, e-g from specimen from Montevideo, Argentina; i, from Brazil): j, male plate, lateral view. 39, *S. dissimilis* Schmidt: c and g from lectotype (setae not shown in c); i from specimen from Mato Grosso, Brazil. 40, *S. linearis* (Walker) specimen from Rio Japura, Brazil; plate and setae not shown.

6. *Genus* STICTOSCARTA Stål

FIGURES 38–43

Stictoscarta Stål, 1869a:61. Type-species: *Tettigonia sulcicollis* Germar, by subsequent designation of Distant, 1908b:68.

Length 14–16 mm.

Head not strongly produced, anterior margin broadly rounded in dorsal aspect, apex bluntly carinate, with a short carina laterad of each ocellus, crown usually without pubescence; antennal ledges usually not strongly elevated dorsally, sulcate; clypellus produced but not angular in lateral aspect, contour of its lower portion at right angle to profile of clypeus; other characters as in *Homoscarta*.

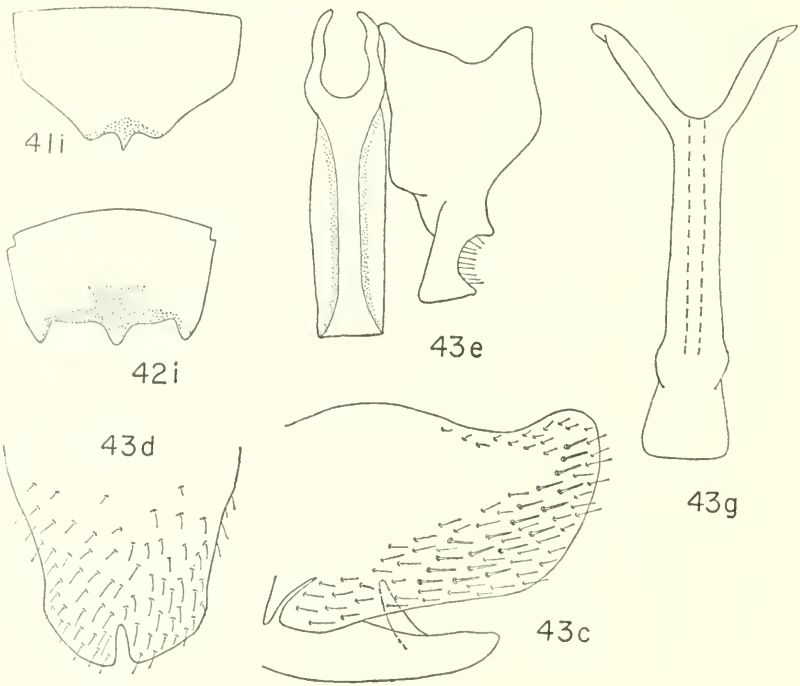
Thorax with pronotum elongate, greatest width nearly equal to transocular width of head, lateral margins convergent anteriorly, with complete transverse sulcus near anterior margin and a broadly interrupted one close behind, disc transversely rugose, posterior margin usually very shallowly concave (convex in *S. indebita* Melichar), with incomplete slightly curved dorsopleural carinae; scutellum usually transversely rugose on posterior portion. Forewing with membrane including all of apical and portion of anteapical cells, veins elevated and distinct, basal portion of surface strongly coriaceous, finely punctate in clavus and adjoining corium, with more than four apical cells, the base of fourth proximal to base of third, without an anteapical plexus of veins, with or without anteapical supernumerary veins to costal margin, wings at rest not attaining ovipositor apex in female. Hindwing and hindlegs as in *Homoscarta*.

Male genitalia: Pygofer produced and rounded apically, with microsetae and occasionally a few macrosetae located usually posteriorly and posteroventrally, absent on disc; pygofer processes absent but with a pair of lobes visible in caudoventral aspect. Plates fused throughout length, not extending posteriorly as far as pygofer apex, each with a dorsal anteapical projection, with numerous dispersed microsetae on apical two-thirds and with very few macrosetae on disc before apex. Style not extending as far posteriorly as apex of connective, with distinct anteapical lobe and truncate apex, with few lateral anteapical setae. Connective Y-shaped, with arms only slightly divergent, stem elongate, keeled. Aedeagus symmetrical, slender, elongate, arched gradually dorsally, with a pair of slender apical processes and occasionally with a pair of processes arising on atrium. Paraphyses absent.

Female abdominal sternum VII with a short median projection from posterior margin, and occasionally with a lateral posterior projection on each side also.

Species of *Stictoscarta* occur in Argentina, Brazil, Trinidad Island, Colombia, and British Guiana. Specimens are rare in collections, and as a result there are problems in associating males and females of the same species. The distinction between *S. sulcicollis* (Germar) and *S. linearis* (Walker) in the key (p. 55), is weak. These species may be synonymous, but longer series are needed to establish this.

Stictoscarta is related to *Dictyodisca* and *Yunga*, from both of which it can be distinguished by its lack of an anteapical plexus on the forewings.



FIGURES 41–43.—**41**, *Stictoscarta indebita* Melichar, lectotype. **42**, *S. exoleta* Melichar, lectotype. **43**, *S. amazonensis*, new species, holotype; both plates shown in **d**.

The identity of *S. sulcicollis* (Germar) is based on a specimen determined by Signoret (NMV). Figures 38a and 38i are from the lectotype of *S. ruficollis* Schmidt. The female of *S. dissimilis* Schmidt illustrated in figure 39i was compared with the lectotype. The illustration (fig.40) of the male pygofer of *S. linearis* (Walker) agrees with the holotype, the other characters being as in *S. sulcicollis*.

SPECIES OF STICTOSCARTA

amazonensis, new species. Upper Amazon.
dissimilis Schmidt, 1928a:44. S. Brazil.
exoleta Melichar, 1926a:278. Colombia.
indebita Melichar, 1926a:277. S. Brazil.
linearis (Walker), 1851b:791 (*Aulacizes*). Br. Guiana, NW. Brazil. New combination.
sulcicollis (Germar), 1821a:62 (*Tettigonia*). Trinidad Is. S. Brazil, N. Argentina.
ruficollis Schmidt, 1928a:45. New synonymy.

KEY TO MALES OF STICTOSCARTA

Not included: *exoleta* Melichar (fig. 42) and *indebita* Melichar (fig. 41), known only from female lectotypes.

1. Aedeagus with basal processes from atrium, as well as apical processes. . . . . S. **dissimilis** Schmidt (fig. 39)
   Aedeagus with apical processes only 2
2. Pygofer with dorsal margin not elevated posteriorly.
   S. **linearis** (Walker) (fig. 40)
   Pygofer with dorsal margin distinctly elevated posteriorly in lateral aspect 3
3. Aedeagus in caudal aspect very narrow.
   S. **sulcicollis** (Germar) (fig. 38)
   Aedeagus in caudal aspect broader.
   S. **amazonensis**, new species

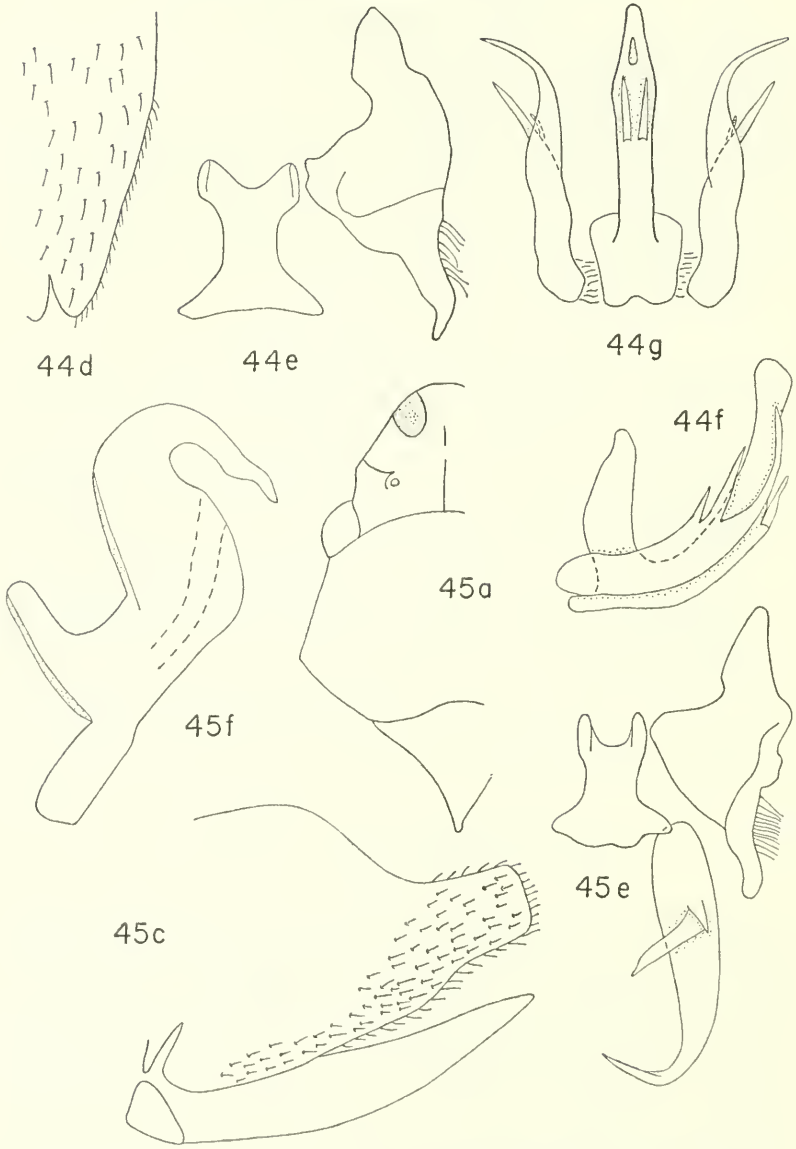
Stictoscarta amazonensis, *new species*

FIGURE 43

Length 16 mm. External characters as in generic description. Pygofer with dorsal margin distinctly concave anteapically, elevated and rounded apically in lateral aspect, microsetae numerous, extending in broad band along posteroventral margin to apex, with a number of interspersed macrosetae, with very small submarginal microsetae located dorsoapically; styles broadly truncate apically; aedeagus in lateral aspect not as strongly arched as in *S. sulcicollis* (Germar), in ventral aspect with shaft much broader than in *S. sulcicollis*. Color sordid brown.

Holotype male with labels "Amazon. sup./Olivenca." and "Coelopola/n. sp." (RMS).

This species is closely related to *S. sulcicollis*, differing in the characters noted above.



FIGURES 44, 45.—**44,** *Yunga coriacea* (Stål), lectotype: **f** and **g** showing aedeagus and paraphyses. **45,** *Y. fuistingi* Schmidt, lectotype: **e** showing only one of the paired paraphyses.

7. *Genus* YUNGA Melichar

FIGURES 44–46

Yunga Melichar, 1924a:208. Type-species: *Aulacizes coriacea* Stål, by original designation.

Length of male 11.5–16.5 mm.

Head moderately triangularly produced, its median length about two-thirds interocular width, with anterior margin elevated and rounded in dorsal aspect, sharply carinate between crown and face, ocelli located slightly before a line between anterior angles of eyes, each about equidistant between adjacent eye angle and median line of crown; with or without a distinct median M-shaped elevation bordering posterior margin, without a longitudinal carina laterad of each ocellus; with a broad shallow median fovea which is widest opposite ocelli; antennal ledges with a longitudinal fovea, in lateral aspect carinate dorsally and with anterior margin abruptly declivous (exception: *Y. coriacea* (Stål)); clypeus depressed medially, with muscle impressions distinct or not; lower portion of face pubescent; clypellus protuberant, the contour of its lower portion at right angle to profile of clypeus.

Thorax with pronotal width greater than transocular width of head, lateral margins convergent anteriorly, disc rugose or rugose and punctate, posterior margin concave, dorsopleural carinae complete, oblique and very slightly bisinuate; scutellum transversely striate on posterior portion. Forewing with only inner apical cell membranous, veins elevated and distinct, texture coriaceous, with clavus and occasionally basal portion of corium punctate, claval veins parallel, occasionally with supernumerary claval crossveins, with an apical plexus of veins in corium and with supernumerary apical veins to costal margin. Hindwing with apex extending almost to apex of forewing, vein R_{2+3} entire. Hindlegs with femoral setal formula 2:0:0; first tarsomere with length equal to or less than combined length of second and third tarsomeres.

Male genitalia: Pygofer moderately produced, posterior margin variable interspecifically in form, with numerous dispersed microsetae at least on posterior and posteroventral portions, without processes but with a pair of sclerotized lobes in conjunctiva IX–X. Plates fused almost throughout their length, extending about as far posteriorly as apex of pygofer, each subtriangular, with numerous dispersed microsetae. Style extending slightly farther posteriorly than apex of connective, without a preapical lobe, the apex narrowly rounded or acute. Connective Y-shaped, the arms short and not widely divergent, stem broadened posteriorly, not keeled. Aedeagus elongate, symmetrical, somewhat variable in form, with or without paired processes on shaft. Paraphyses

present, separated at base, each articulated with posterolateral angle of connective and with one or more short branches, each paraphysis closely associated with base of aedeagus and connected with it by a membrane.

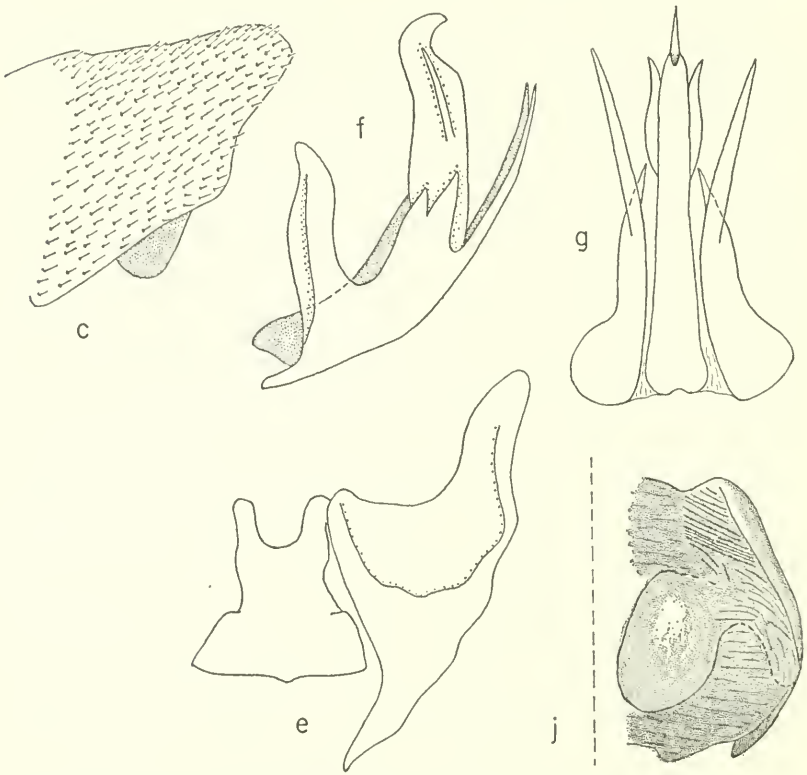


FIGURE 46.—*Yunga cartwrighti*, new species (plates not shown in **c**, paraphyses shown in **f** and **g**): **j**, male pygofer, right side, posterior view.

Yunga is known from Central America and Colombia. Specimens are very rare in collections. The female is known only for the type-species, in which the abdominal sternum VII is well produced and with the posterior margin transverse and bearing a conspicuous median triangular tooth. The paraphyses of the male genitalia might also be considered as aedeagal processes, since they articulate with the connective and are closely associated with the base of the aedeagus. The form of the male genitalia strongly suggests a relationship of this genus with

Homoscarta, but the head is much more produced than in *Homoscarta*, and the species are much less robust.

In *Y. coriacea* (Stål), the male pygofer and its lobes, not illustrated here, are like those of *Y. cartwrighti*, new species.

SPECIES OF YUNGA

cartwrighti, new species. Costa Rica, Panama.
coriacea (Stål), 1864a:80 (*Aulacizes*). Mexico.
fuistingi Schmidt, 1928c:53. Colombia.

KEY TO MALES OF YUNGA

1. Aedeagal shaft without anteapical processes.
Y. fuistingi Schmidt (fig. 45)
Aedeagal shaft with anteapical processes 2
2. Aedeagal shaft processes appearing lateral and lyriform in caudoventral aspect . . . . . **Y. cartwrighti**, new species
Aedeagal shaft processes ventral and subparallel in ventral aspect.
Y. coriacea (Stål) (fig. 44)

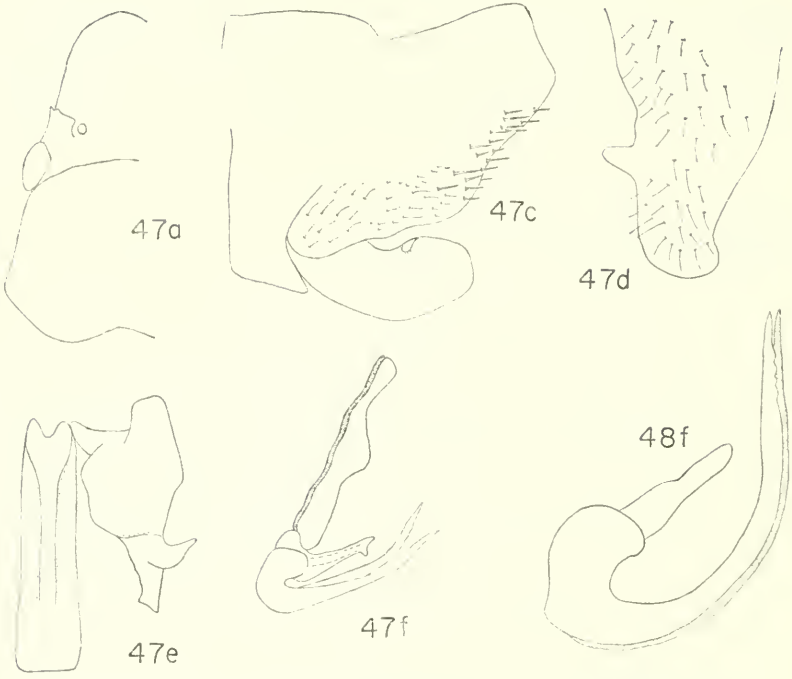
Yunga cartwrighti, *new species*

FIGURE 46

Length of male 11.5–15 mm. Head with a distinct M-shaped elevation bordering posterior margin, clypeus with muscle impressions not very distinct. Forewing with clavus and basal portion of corium punctate, with a claval crossvein. Hindlegs with length of first tarsomere about equal to combined length of second and third. Male pygofer with posterior margin oblique and slightly concave; style acute at apex; paraphyses each with two short branches near midlength, the apical half slender and aciculate; aedeagal shaft slightly decurved at apex, with a pair of anteapical lateral processes which appear lyriform in caudoventral aspect. Color sordid brown, with red (type) or yellow spots on pronotum, with an interrupted median scutellar line, a number of spots of various sizes on forewings, markings on clypeal muscle impressions, on midline of clypellus, and spots on fore- and middle femora, yellow.

Holotype male, Turrialba, Costa Rica, May 31, 1951 (O. L. Cartwright), and two additional male specimens from Panama (USNM). The Panama males are considerably larger than the type, but the genitalia appear identical.

This species is named in honor Dr. O. L. Cartwright of the U.S. National Museum, who collected the type.



FIGURES 47, 48.—47, *Mareba panamensis*, new species, holotype. 48, *M. eresia* Distant, lectotype.

8. *Genus* MAREBA Distant

FIGURES 47–50

Mareba Distant, 1908b:77. Type-species: *M. eresia* Distant, by original designation and monotypy.

Caripuna Melichar, 1926a:318. Type-species: *Tettigonia guerini* Signoret, by original designation and monotypy. New synonymy.

Anchura Melichar, 1926a:344. Type-species: *Mareba eresia* Distant, designated here (previous references to type-species refer to nomen nudum). New synonymy.

Anchuralia Evans, 1947a:159, as new name for *Anchura* Melichar. New synonymy.

Length 12–20 mm.

Head strongly produced, median length exceeding interocular width, anterior margin slightly elevated and carinate, ocelli located slightly before a line between anterior margins of eyes, each equidistant between adjacent anterior eye angle and midline of head, with or without M-shaped elevation bordering posterior margin, with a broad median fovea extending from base almost to apex and slightly narrowed near

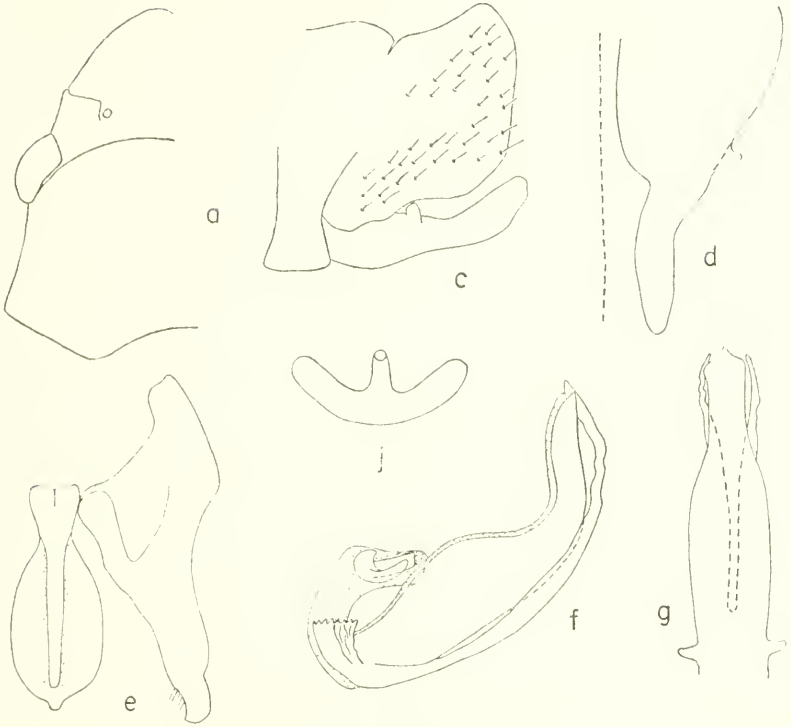


FIGURE 49.—*Mareba guerini* (Signoret), lectotype (setae not shown in **d**, base of left process not illustrated in order to show aedeagus in **f**): **j**, aedeagus, dorsal aspect, processes not shown.

midlength, with a few longitudinal or oblique wrinkles near posterior margin of disc, with a longitudinal carina laterad of each ocellus, disc often with few short setae but no conspicuous pubescence; antennal ledges longitudinally sulcate and dorsally carinate in lateral aspect, anterior margins declivous; clypeus with disc flattened or slightly depressed, muscle impressions distinct; entire face finely pubescent; clypellus not produced, not laterally compressed, its contour continuing profile of clypeus.

Thorax with pronotal width greater than transocular width of head, lateral margins convergent anteriorly, with a series of deep depressions behind anterior margin, disc punctate or pitted and occasionally rugose, with a pair of slight elevations near middle of concave posterior margin, dorsopleural carina present or absent, arcuate and not very distinct when present; scutellum transversely striate in posterior half. Forewing with only inner apical cell membranous, veins usually distinct,

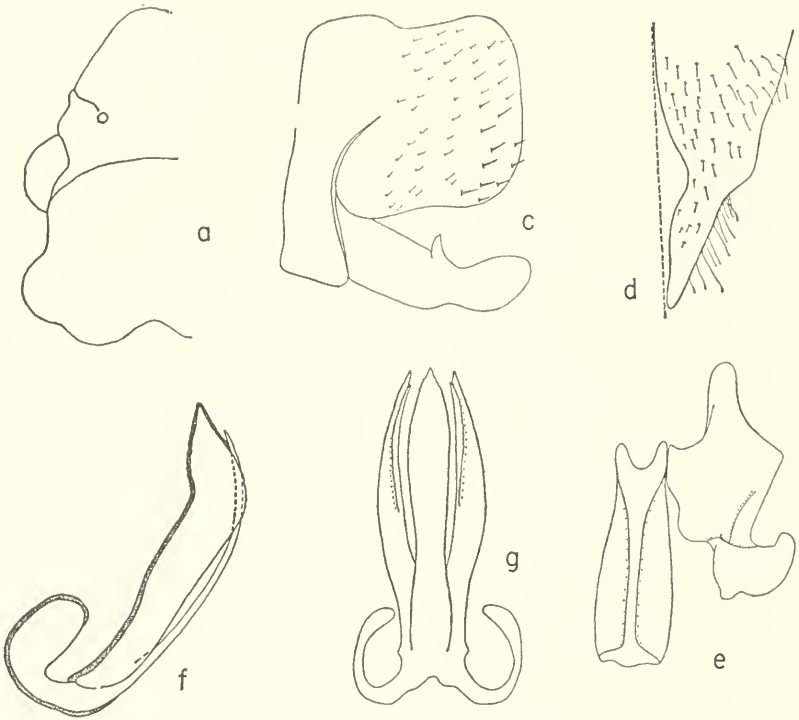


FIGURE 50.—*Mareba curuna*, new species, holotype.

occasionally elevated, clavus and corium coriaceous and punctate, occasionally with a few shallow pits in clavus, with more than four very short apical cells, corium with an anteapical plexus of veins and supernumerary anteapical crossveins to costal margin; ovipositor exposed or not with wings at rest. Hindwing at rest extending almost as far posteriorly as forewing, vein R_{2+3} entire. Hindlegs with femoral setal formula 2:0:0; first posterior tarsomere shorter than combined length of second and third.

Male genitalia: Pygofer not strongly produced posteriorly, with microsetae dispersed regularly over entire posterior half, or restricted to lower portion of posterior half, with a few interspersed small macrosetae, without processes. Plates separate throughout their length, with length variable, in lateral aspect rounded apically and with a median dorsal short projection, with numerous dispersed microsetae. Style with length variable compared with connective, with or without preapical lobe, apex variably modified. Connective linear, with a partial or complete longitudinal keel. Aedeagus symmetrical, with a pair of lateral processes arising at base. Paraphyses absent.

Female sternum VII narrow and triangular in the single species in which the female is known (*M. curuna*, new species).

Specimens belonging to this genus have been examined from Panama, French Guiana, Ecuador, and Peru. The genus *Mareba* is closely related to *Proconobola*, new genus, from which it can be distinguished by the peculiar form of its male plates, its smooth forewings, and its regularly slanted face.

A specimen of the undescribed species upon which Melichar apparently intended to base *Anchura* has been examined in HNHM. It falls within the present concept of *Mareba*.

Except for the aedeagus, illustrated in figure 48f, the male genital characters of the lectotype of *M. eresia* Distant are like those illustrated for *M. panamensis*, new species.

SPECIES OF MAREBA

curuna, new species. Fr. Guiana.
eresia Distant, 1908b:77. Ecuador.
guerini (Signoret), 1855a:51 (*Tettigonia*). Fr. Guiana. New combination.
panamenis, new species. Panama.

KEY TO MALES OF MAREBA

1. Aedeagal shaft very much shorter than processes 2
   Aedeagal shaft almost as long as processes.
   M. curuna, new species
2. Aedeagus with three processes arising from base.
   M. guerini (Signoret) (fig. 49)
   Aedeagal shaft with only two processes arising from base. . . 3
3. Aedeagal shaft rounded at apex. . . . M. eresia Distant (fig. 48)
   Aedeagal shaft emarginate apically.
   M. panamensis, new species (p. 64)

Mareba curuna, *new species*

FIGURE 50

Length of male 11.5 mm.; of female 12–13 mm. A species with a wrinkled appearance dorsally. Head with median length approximately equal to transocular width, with a distinct posterior M-shaped elevation. Forewings with shallow pits in clavus and veins fairly distinct. Male pygofer with posterior margin very broadly truncate, lower margin horizontal; plates in ventral aspect subacute apically, in lateral aspect extending farther posteriorly than apex of pygofer; each style with a broad apical expansion which is extended laterally and rounded; aedeagal shaft extending almost as far posteriorly as the conspicuous paired lateral processes each of which is branched apically.

Female abdominal sternum VII very narrow, produced, triangular, exposing the first valvifer at each side. Color of anterior dorsum dull brown, forewings dull brown with vague darker markings, with one or two pale orange spots in clavus near base, and irregular vermiculate transverse markings in corium, sometimes interrupted, also orange.

Holotype male with labels "Roches de Kourou/Guyane Francse/ Collection Le Moult" and "Coll. 1," on indefinite loan to USNM from NCS and three female specimens, same data (NCS).

This species is closely related to *M. guerini* (Signoret) but differs in the bizzarre modification of the style apex in *M. curuna* and the very short aedeagal shaft in *guerini.*

Mareba panamensis, *new species*

FIGURE 47

Length 16 mm. Head with median length considerably exceeding transocular width, without a distinct M-shaped elevation bordering posterior margin. Forewings with veins very indistinct almost as far posteriorly as claval apex, clavus without pits. Male pygofer more produced than in *M. curuna*, new species, not broadly truncate apically, with lower margin irregularly oblique; plates in lateral aspect extending not nearly as far posteriorly as posterior pygofer margin, in ventral aspect with apices broadly rounded; styles truncate apically, without a broad apical expansion; aedeagus with shaft not nearly as long as basal processes. Color dull brown, the forewings with apical third black.

Holotype male with labels "Cerro Campana/Pan 1–VIII 1951" and "F. S. Blanton/Collector," in USNM.

This species is closely related to *M. eresia* Distant, but differs from the Distant species in that the latter has a rounded aedeagal apex whereas *M. panamensis* has a concave aedeagal apex.

9. PROCONOBOLA, *new genus*

FIGURES 51–53

Type-species: *Amblydisca callidula* Jacobi.

Length 13–14 mm.

Head well-produced, median length equal to or less than interocular width, anterior margin broadly rounded in dorsal aspect (exception: *P. nodosula* (Melichar)), anterior margin with a carina at transition from crown to face, disc with a full-length median fovea extending between elevated anterior and posterior margins, with a conspicuous M-shaped elevation bordering posterior margin, with a longitudinal

carina laterad of each ocellus, disc with sparse pubescence; antennal ledges with or without a longitudinal fovea, in lateral aspect with anterior margins steeply declivous; clypeus with disc usually depressed, muscle impressions distinct; face finely pubescent, clypellus protuberant, longitudinally carinate, contour of its lower portion at right angle to profile of clypeus.

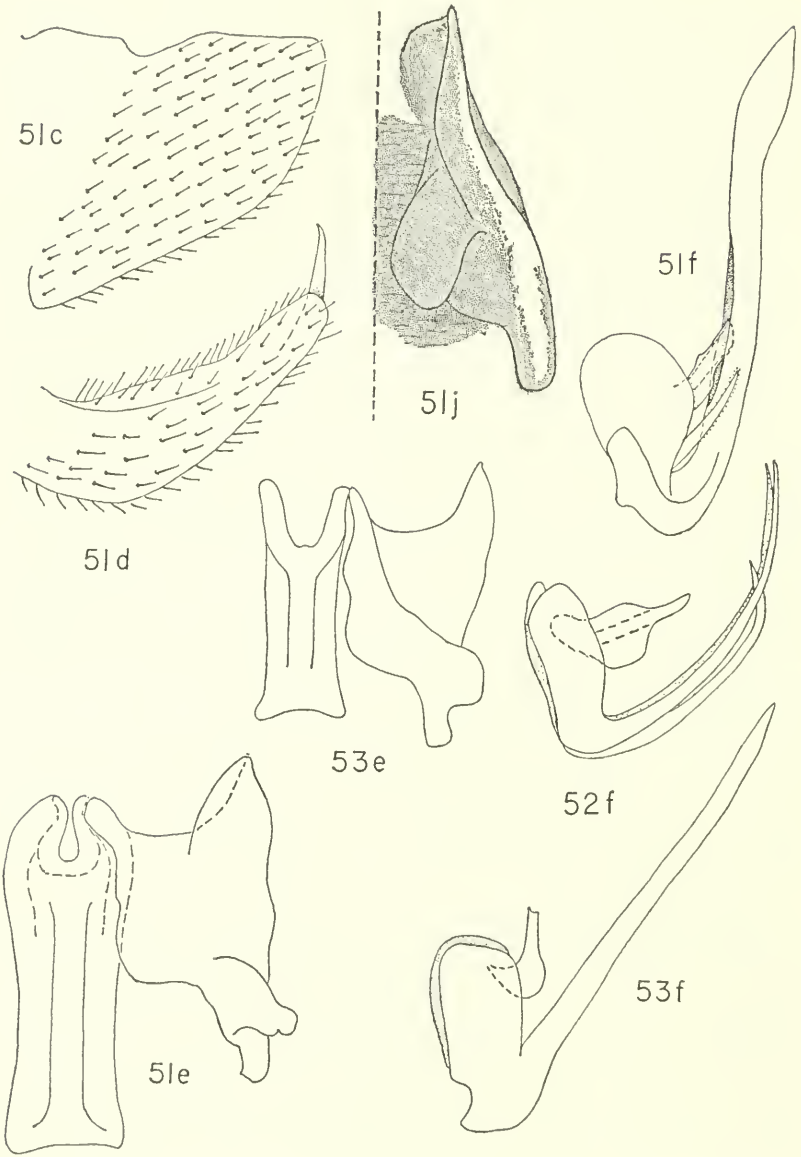
Thorax with pronotal width greater than transocular width of head, lateral margins convergent anteriorly, disc with several callosities and rugose or punctate, finely pubescent, posterior margin concave, with dorsopleural carinae complete; scutellum transversely striate in apical half. Forewing with or without a membrane, reduced when present, surface with several wrinkled areas or nodules, veins elevated and distinct, with more than four apical cells, corium with a discal plexus of veins, with or without anteapical supernumerary veins to costal margin. Hindwing at rest extending almost as far posteriorly as forewing; vein R_{2+3} entire. Hindlegs with femoral setal formula 2:0:0; first tarsomere shorter than combined length of second and third.

Male genitalia: Pygofer well-produced and rounded apically, with numerous microsetae dispersed uniformly over surface except basidorsally, without processes, but occasionally with internal folds. Plates separate, length varying interspecifically compared to pygofer, gradually tapered and with a spinelike apical projection, with numerous uniformly dispersed microsetae. Style with length variable interspecifically in relation to connective, with distinct preapical lobe, not or only slightly modified apically. Connective broadly linear with basal arms not divergent, keeled medially. Aedeagus symmetrical with shaft short, with an unpaired median basal process and often with a pair of lateral processes. Paraphyses absent.

Female unknown.

Specimens belonging to this genus are rare in collections. *Proconobola* appears to be restricted to the Andes. The known generic range is Ecuador, Peru and Bolivia. *Proconobola* is similar to *Yunga* in general appearance. If differs in a number of characters, including its peculiar male plates, the form of its styles, its more elongate connective and the median ventral process of the aedeagus. It is also related to *Mareba*, in the discussion of which (p. 63) distinguishing characters have been noted.

The lectotype of *P. callidula* (Jacobi) was dissected and the genitalia were found to agree well with the specimen illustrated in figure 51. Except for the aedeagus (fig. 52f), the lectotype of *P. dubia* (Schmidt) has genital characters like those of *P. callidula* (Jacobi) except that there are no lobes in the posterior membrane of the genital capsule, and except that the styles and connective are like *P. nodosula* (Melichar).



FIGURES 51–53.—51, *Proconobola callidula* (Jacobi), specimen from Mapiri, Bolivia (plate not shown in c, shown in lateral aspect in d): j, pygofer, right side, posterior view. 52, *P. dubia* (Schmidt), lectotype. 53, *P. nodosula* (Melichar), lectotype, aedeagal shaft possibly broken at apex in f.

The male genital characters of *P. nodosula* (Melichar) are like the illustrations of *P. callidula* (Jacobi) except for the structures illustrated.

SPECIES OF PROCONOBOLA

callidula (Jacobi), 1905c:165 (*Amblydisca*). Peru, Bolivia. New combination.
dubia (Schmidt), 1928c:55 (*Yunga*). Ecuador. New combination.
nodosula (Melichar), 1924a:210 (*Yunga*). Bolivia. New combination.

KEY TO MALES OF PROCONOBOLA

1. Aedeagus without paired processes (fig. 53).
P. nodosula (Melichar)
Aedeagus with paired processes (figs. 51, 52) 2
2. Aedeagus with apices of paired processes exceeding apex of unpaired process. . . . . P. dubia (Schmidt) (fig. 52)
Aedeagus with apices of paired processes not attaining midlength of unpaired process. . . . . P. callidula (Jacobi) (fig. 51)

10. Genus ZYZZOGETON Breddin

FIGURE 54

Zyzzogeton Breddin, 1902a:178. Type-species: *Z. haenschi* Breddin, by monotypy.
Williamsiana Goding, 1926a:103. Type-species: *W. ferruginosa* Goding, which is a synonym of *Zyzzogeton haenschi* Breddin, by monotypy.

Length 20–22 mm.

Head with crown well-produced, median length considerably less than transocular width, apex elevated and carinate; ocelli located on a line between anterior angles of eyes, each equidistant from adjacent eye angle and midline of crown; with a median full-length fovea which is much broader apically than at base, without an M-shaped elevation bordering posterior margin, with a longitudinal carina laterad of each ocellus; lateral clypeal sutures extending onto crown; antennal ledges protuberant, with a narrow longitudinal fovea, in lateral aspect not carinate dorsally, abruptly declivous anteriorly; face with clypeus concave, muscle impressions prominent, transclypeal sulcus not entire, pubescent below; clypellus produced and angular in lateral aspect, carinate medially.

Thorax with pronotum much wider than head, lateral margins convergent anteriorly, coarsely rugose to punctate, inconspicuously pubescent, with a pair of very conspicuous conical dorsal discal protuberances extending dorsally and laterally, posterior margin concave, with rectilinear dorsopleural carinae, scutellum transversely striate in posterior half. Forewings without a membrane, veins elevated and distinct, claval veins parallel, veins of corium forming a plexus apically, with supernumerary anteapical crossveins to costal margin; wing apices

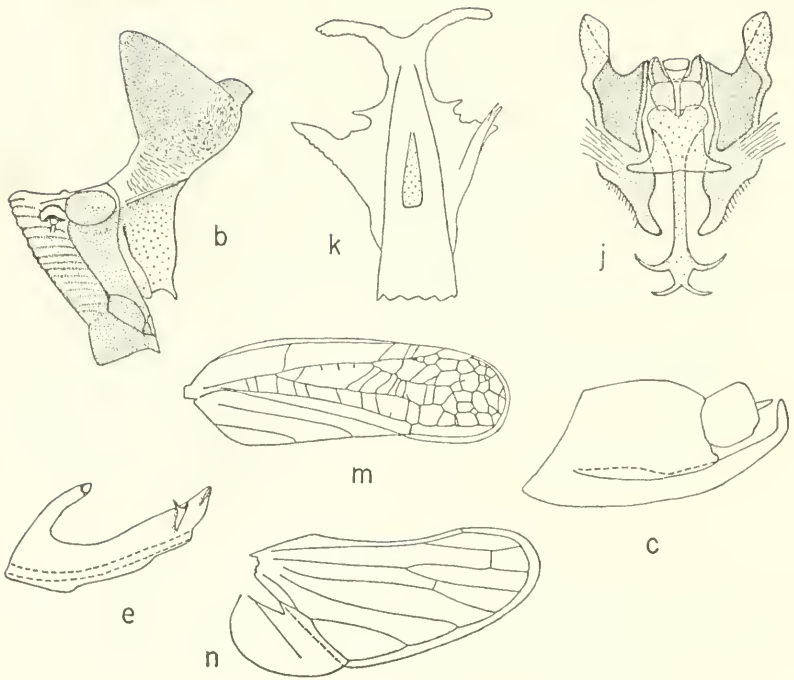


FIGURE 54.—*Zyzzogeton haenschi* Breddin (setae not shown in c): **j,** styles, connective, and aedeagus, dorsal view; **k,** aedeagal apex, ventral view, specimen from Balzapamba, Ecuador; **m,** forewing; **n,** hindwing.

of female at rest extending posteriorly farther than ovipositor. Hindwing extending as far posteriorly as forewing; vein R_{2+3} entire. Hindlegs with knees in rest position not attaining posterior proepimeral margins; femoral setal formula 2:0:0; first tarsomere much shorter than combined length of second and third.

Male genitalia: Pygofer short, posterior margin truncate, with microsetae on and near ventral margin only. Plates fused basally, extending posteriorly much beyond posterior pygofer margin, with numerous fairly long microsetae. Style extending apically much beyond apex of connective, without preapical lobe, rounded apically. Connective Y-shaped, not keeled. Aedeagus symmetrical, slender, elongate, with two pairs of apical processes. Paraphyses absent.

Female abdominal sternum VII quite broad, produced posteriorly in a median triangular projection.

Specimens have been studied only from Ecuador and Colombia. There appears to be a considerable amount of variation in the apex of the aedeagus. *Zyzzogeton* is related to *Procandea*, from which it may be

distinguished easily by its large pronotal elevations, its widely separated posterior tibial spines, the absence of an M-shaped elevation bordering the posterior margin of the crown, its foveate antennal ledges, and its rather short male pygofer in relation to the length of the plates.

Dr. James P. Kramer (in litt.) has called attention to the new combination and new synonym in the following check list.

The genitalia of the lectotype of *Z. haenschi* Breddin are closely similar to those in figure 54, with the apex of the aedeagus being closer to figure 54k than to 54j.

SPECIES OF ZYZZOGETON

[*Type not seen.]

haenschi Breddin, 1902a:178. Ecuador.

**ferruginosa* (Goding), 1926a:103 (*Williamsiana*).

**viridipennis* (Latreille), 1811a:215 (*Ledra*). Colombia. New combination.

mazaria Distant, 1908b:84. New synonymy.

KEY TO SPECIES OF ZYZZOGETON

Forewings brown; pronotal protuberances narrowly divergent in caudal aspect. . . . . Z. haenschi Breddin (fig. 54)

Forewings green; pronotal protuberances broadly divergent in caudal aspect. . . . . Z. viridipennis (Latreille)

11. PROCANDEA, *new genus*

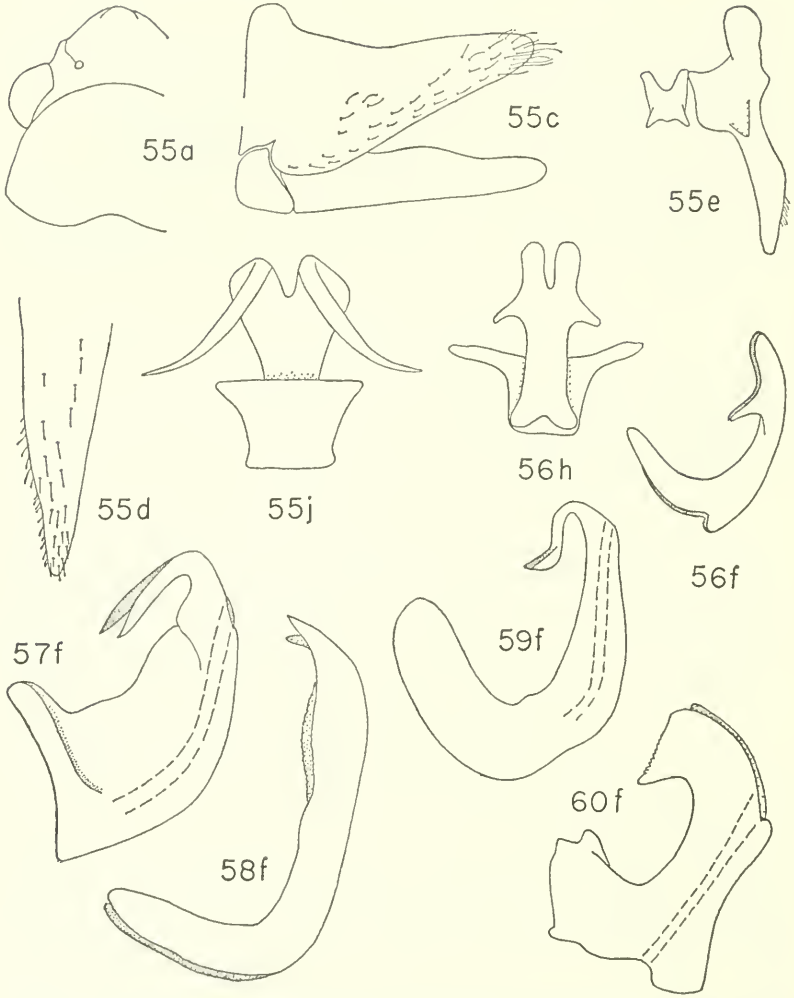
FIGURES 55–70

Type-species: *Tettigonia corticata* Signoret.

Length 14–22.5 mm.

Head moderately produced, median length considerably less than interocular width, apex elevated and carinate, ocelli on line between anterior angles of eyes, each equidistant between adjacent eye angle and median line, crown with an M-shaped elevation bordering posterior margin, with a broad shallow median fovea, with a slight, indistinct longitudinal carina laterad of each ocellus, disc with or without pubescence; antennal ledges not foveate, usually not carinate dorsally in lateral aspect, anterior edges declivous; clypeus with disc depressed, muscle impressions distinct; face finely pubescent, clypellus protuberant, keeled, contour of its lower portion at right angle to profile of clypeus.

Thorax with pronotal width greater than transocular width of head, lateral margins usually convergent, disc punctate, rugose, or pitted, pubescent or not, posterior margin concave, with a complete dorsopleural carina which is arched ventrally; scutellum transversely striate on posterior half. Forewing with or without a membrane, veins elevated and distinct, surface occasionally pitted, usually with four short



FIGURES 55–60.—55, *Procandea corticata* (Signoret), specimen from "East of Mavis" (NCS): j, aedeagus, dorsal view. 56, *P. peruensis*, new species, holotype. 57, *P. quechua*, new species. 58, *P. furcata*, new species, holotype, 59, *P. cordillerae*, new species, holotype. 60, *P. inca*, new species, specimen from Chanchamayo, Peru.

apical cells, base of third apical cell usually more distal than base of fourth, usually without a discal plexus of veins but with supernumerary crossveins to costal margin near apex. Hindwing at rest extending almost as far posteriorly as forewing; vein R_{2+3} entire. Hindlegs with femoral setal formula 2:0:0 or 2:1:1; first tarsomere with length less than combined length of second and third tarsomeres.

Male genitalia: Pygofer in lateral aspect narrow and tapered, with rather long, dispersed microsetae, occasionally with a few macrosetae, without processes. Plates separate throughout length, usually extending posteriorly as far as, or farther than pygofer apex, elongate triangular, with numerous dispersed microsetae (rarely with a few macrosetae). Style extending much farther posteriorly than apex of connective, with prominent preapical lobe, rounded apically. Connective very short, Y-shaped with arms not widely divergent, stem very broad. Aedeagus very short, usually bifid apically or with paired apical processes. Paraphyses absent.

Female abdominal sternum VII with posterior margin usually trilobate (most species known only from males).

Procandea is known only from Amazonas, Ecuador, Peru, and Bolivia. The genus is related to *Zyzzogeton*, in the discussion of which distinguishing characters are treated. *Procandea* is more closely related to *Ciccus*, from which it may be distinguished by the characters mentioned in the key (p. 21). Species of *Procandea* are much similar to one another externally, and can be separated reliably only by the characters of the male genitalia.

The male genitalia of the lectotype of *P. corticata* (Signoret) agree closely with figure 55. The species is closely related to *Procandea cirta* (Distant), which is known only from the female lectotype (fig. 70i). The male genitalia of *P. marcia* (Distant) are as in figure 68, with the style and connective very close to figure 67e.

SPECIES OF PROCANDEA

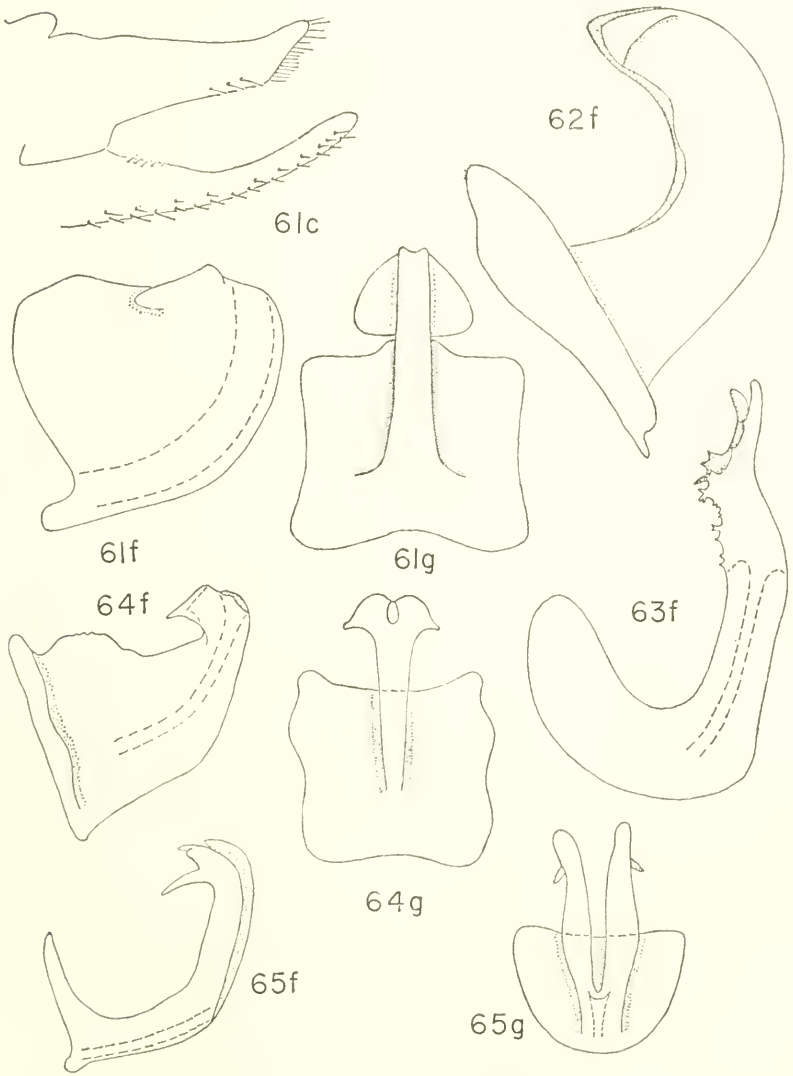
andina, new species. Peru.
arcuata, new species. Peru, Bolivia.
cirta (Distant), 1908b:70 (*Amblydisca*). Ecuador. New combination.
cordillerae, new species. Peru.
corticata (Signoret), 1855b:226 (*Tettigonia*). Ecuador, Peru. New combination.
exasperatula, new species. Ecuador.
furcata, new species. Peru.
inca, new species. Peru, Bolivia.
loretoensis, new species. Peru.
marcia (Distant), 1908b:68 (*Stictoscarta*). Amazonas, Peru, Ecuador. New combination.
monticola, new species. Peru, Bolivia.
ochracea, new species. Peru.
peruensis, new species. Peru.
quechua, new species. Peru.
reticulata, new species. Peru, Bolivia.
salazari, new species. Peru.

KEY TO MALES OF PROCANDEA

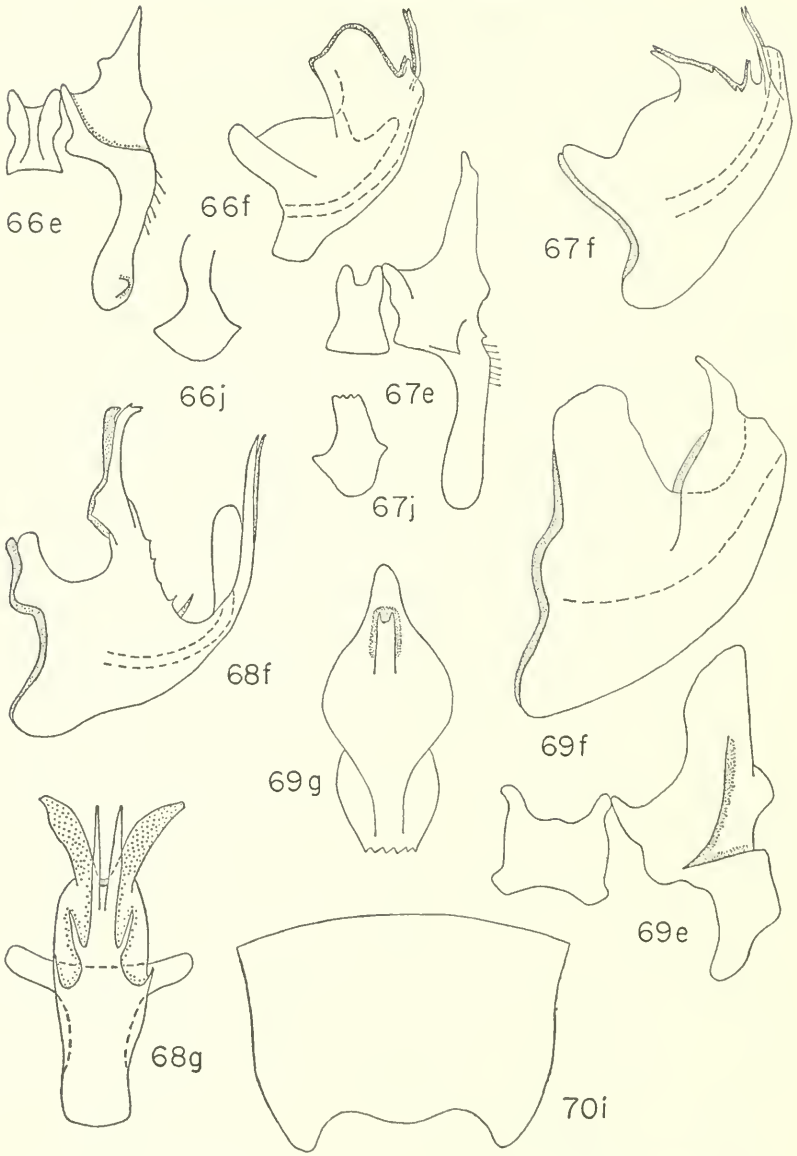
Not included: *cirta* (Distant) (fig. 70i).

1. Aedeagus in lateral aspect very broad, width of its shaft about equal to its length (fig. 61) . . P. **monticola**, new species (p. 75)
   Aedeagus not as above 2
2. Aedeagus with a pair of dorsal processes near base, in addition to apical processes . . . . . P. **marcia** (Distant) (fig. 68)
   Aedeagus without processes near base 3
3. Aedeagus in lateral aspect narrow and with a pair of short, retrorse, anteapical processes (fig. 56) . P. **peruensis**, new species (p. 75)
   Aedeagus not so 4
4. Aedeagus with more than two apical processes 5
   Aedeagus with only one or two apical processes 6
5. Aedeagal dorsal anteapical processes very broad.
   P. **reticulata**, new species (p. 78)
   Aedeagal dorsal anteapical processes very narrow.
   P. **loretoensis**, new species (p. 79)
6. Aedeagus with an unpaired dorsal apical process.
   P. **exasperatula**, new species (p. 79)
   Aedeagus with two apical processes 7
7. Aedeagal processes in lateral aspect each with anterior margin coarsely, irregularly serrate (fig. 63).
   P. **andina**, new species (p. 76)
   Aedeagal processes not so 8
8. Aedeagal processes apical, very broad, curved dorsad, truncate apically (fig. 60) . . . . . P. **inca**, new species (p. 76)
   Aedeagal processes not so 9
9. Aedeagal processes dorsoapical and slender, directed basally . . 10
   Aedeagal processes in lateral aspect broad, or continuing curvature of aedeagal shaft 12
10. Aedeagal processes elongate (fig. 55j), in lateral aspect extending to base of aedeagus . . . . . P. **corticata** (Signoret)
    Aedeagal processes shorter 11
11. Aedeagus more slender, dorsal margin more strongly concave (fig. 59) . . . . . P. **cordillerae**, new species (p. 77)
    Aedeagus broader, dorsal margin less concave (fig. 57).
    P. **quechua**, new species (p. 79)
12. Aedeagal processes each branched at apex.
    P. **ochracea**, new species (p. 79)
    Aedeagal processes not branched apically 13
13. Aedeagal processes directed cephalad in lateral aspect.
    P. **salazari**, new species (p. 75)
    Aedeagal processes not directed cephalad 14

14. Aedeagal shaft strongly concave on dorsal margin.
P. arcuata, new species (p. 77)
Aedeagal shaft much less concave on dorsal margin.
P. furcata, new species (p. 78)



FIGURES 61–65.—**61**, *Procandea monticola*, new species, holotype. **62**, *P. arcuata*, new species, specimen from Tingo María, Peru. **63**, *P. andina*, new species, holotype. **64**, *P. salazari*, new species, holotype. **65**, *P. ochracea*, new species, holotype.



FIGURES 66–70.—**66**, *Procandea reticulata*, new species, holotype: j, style apex, lateral view. **67**, *P. loretoensis*, new species, holotype: j, style apex. **68**, *P. marcia* (Distant), specimen from Peru (NMV). **69**, *P. exasperatula*, new species, holotype. **70**, *P. cirta* (Distant), lectotype.

Procandea monticola, *new species*

FIGURE 61

Length 16–17 mm. Forewing without a distinct membrane. Male plates extending farther posteriorly than pygofer; pygofer obliquely truncate apically, with few submarginal microsetae near ventral margin and few at apex, disc without setae; aedeagus short, in lateral aspect with length equal to width, in ventral aspect with shaft narrow and with a flangelike pair of apical processes. Female abdominal segment VII with posterior margin trilobate, the lateral lobes extending farther posteriorly than the median lobe. Color black to castaneous marked with weakly contrasting and indistinct markings of sordid green to greenish yellow.

Holotype male and three additional males, Santa Isabel, Dept. Cuzco, Peru (Felix L. Woytkowski) (NCS); one female from Callanga, Peru, and one labeled "Bolivien" (HNHM). Holotype on indefinite loan to USNM.

Procandea salazari, *new species*

FIGURE 64

Length of male 22.5 mm. Forewing as in *P. monticola*, new species. Male pygofer narrowly rounded apically with dispersed microsetae and a few macrosetae on apical third, setae concentrated on anteapical ventral margin and at apex; plates extending farther posteriorly than pygofer apex; aedeagus quite broad at base, strongly narrowed in apical half, with a pair of anteapical dorsal processes extending from shaft at less than a right angle in lateral aspect, in ventral aspect with base of shaft quite narrow, shaft gradually widened towards apex, the apical processes each appearing somewhat avicephaliform. Color as in *P. monticola*, new species.

Holotype male, Chanchamayo, Peru, on indefinite loan to USNM from NCS.

This species is named in honor of Agricultural Engineer Juan Salazar of the Agricultural Experiment Station at La Molina, Peru, who collected with the author in the Chanchamayo Valley and who was most helpful in many ways. This species is related to *P. monticola*, new species from which it can be separated by the form of the aedeagus.

Procandea peruensis, *new species*

FIGURE 56

Length 14–16 mm. Forewings with membrane including first, second, and third apical cells. Male pygofer rounded apically, with

dispersed microsetae extending from middle of disc to apex. Aedeagus short, curved gradually dorsad, bifid at apex with the rami rounded, with a pair of retrorse anteapical processes. Color of type: anterior dorsum yellow, a broad median coronal sagittate marking and a lateral diagonal marking across each ocellus, a short median basal marking extending to an irregular transverse submarginal marking on pronotum, basal angles and an arcuate transverse marking on scutellum, castaneous. Other specimens less distinctly marked. Forewings fuscous with a number of dull yellow spots some of which may be confluent.

Holotype male with labels "Tingo Maria/Huan. Peru/Dec. 28, 1946/alt. 2200 ft." and "J. C. Pallister/Coll. Donor/Frank Johnson," and one topotypic specimen (AMNH); five males from Monzón Valley, near Tingo María, September and November (CAS); and two additional specimens from Cumbasé, Peru (MMB).

Procandea andina, *new species*

FIGURE 63

Length 15 mm. Forewings with membrane as in *P. peruensis*, new species. Pygofer obliquely truncate apically, caudoventral margin concave, with a number of microsetae on disc and submarginal along caudoventral margin to apex; aedeagus with dorsal margin concave, bifid apically with the arms of the rami irregularly serrate on anterior margin. Anterior dorsum dull sordid yellow, obscurely marked with castaneous and black. Forewings dull castaneous obscurely marked with sordid yellow.

Holotype male with labels "Marcapata/Peru" and "409." and "corticata," on indefinite loan to USNM from NCS.

Procandea inca, *new species*

FIGURE 60

Length 15–17 mm. Pygofer slender, rounded at apex, with a few microsetae near apex; aedeagus with a pair of broad apical truncate processes directed dorsally, the truncate edges weakly serrate. Color as in typical *P. peruensis*, new species (see above).

Holotype male with label "Mapiri/Bolivia" on indefinite loan to USNM from NCS. Two additional males have been studied, one topotypic (MMB), the other from Chanchamayo, Peru (NCS).

Procandea cordillerae, *new species*

FIGURE 59

Length 17 mm. Forewings without a membrane at apex. Pygofer as in *P. inca*, new species (see p. 76); aedeagus with shaft gradually tapered in lateral aspect, with a pair of narrow apical processes arising dorsally, extending towards base, each bisinuate. Color much as in typical *P. peruensis*, new species (see above).

Holotype male with label "Cusca, Peru/June 24, 1952/ F. L. Woytkowski," on indefinite loan to USNM from NCS. The label is a typographical error for "Cuzco."

Procandea quechua, *new species*

FIGURE 57

Length 16–17 mm. Forewings without a membrane. Pygofer much as in *P. peruensis*, new species (see p. 75); aedeagus with dorsal margin weakly concave in lateral aspect, with a pair of processes arising apically and dorsally, extending basad, regularly curved, acute apically. Color as in *P. monticola*, new species (see p. 75).

Holotype male with labels "Callanga/Paucartambo Prov./Dept. Cusco, Peru" and "Feb. 23, 1952/F. L. Woytkoski," on indefinite loan to USNM from NCS; two topotypic male specimens (NCS); and one male topotype (RMS).

This species appears to be closely related to *P. cordillerae*, new species, but the aedeagus is much broader and less strongly curved in lateral aspect in *P. quechua*.

Procandea arcuata, *new species*

FIGURE 62

Length 16–17 mm. Forewing with inner three apical cells membranous. Male genitalia as in *P. inca*, new species (see p. 76), except aedeagus, which has two processes longer than shaft, curved gradually dorsolaterally to near apex where they are more abruptly divergent. Color as in typical *P. peruensis*, new species (see p. 75).

Holotype male with labels "Satipo, Peru/May, 1944" and "A. Maller Coll./Frank Johnson/Donor," and a pair of specimens from Tingo María, Peru (AMNH); one male from Mapiri, Bolivia (NCS).

This species is related to *P. furcata*, new species (see below), but the latter has the aedeagus much less strongly curved.

Procandea furcata, *new species*

FIGURE 58

Length 16 mm. Forewings with membrane including inner three apical cells. Male pygofer rounded apically, with submarginal microsetae parallel to caudoventral margin to apex; aedeagus with paired apical branches extending in same direction as axis of shaft, divergent apically. Anterior dorsum dull yellowish green with a black M-shaped marking on posterior margin of head and with median coronal fovea darkened, pronotum with three dark spots near anterior margin and three angular confluent castaneous markings on disc, scutellum black with apex sordid yellow in male; with an additional kidney-shaped yellow mark in basal half in female; forewings marked as in typical *P. peruensis*, new species (see p. 75).

Holotype male with label: "Chanchamayo/Peru" on indefinite loan to USNM from NCS and four topotypes of both sexes, March and April (CAS).

P. furcata can be separated readily from other species of the genus by the processes of the aedeagus, which lack ornamentation and which extend, in lateral aspect, in a continuation of the long axis of the aedeagal shaft.

Procandea reticulata, *new species*

FIGURE 66

Length 18 mm. Forewings with a distinct membrane which includes inner and greater portion of second, third, and fourth apical cells, with a distinct anteapical plexus of veins. Male pygofer extending farther posteriorly than apices of male plates, with numerous dispersed microsetae on lower half; style apex in broadest view expanded anteapically; aedeagus with a pair of broad dorsal anteapical processes, each of which bears a short and a long apical process (fig. 66f). Female abdominal sternum VII with posterior margin biundulate on each side of a median, weakly produced, convex, lobe. Color as in *P. monticola*, new species.

Holotype male, locality illegible, Bolivia (RMS); one female from Bolivia (BM); and one female from Satipo, Peru (AMNH).

This species has an aedeagus much more complex than the other species of *Procandea*, except *marcia* (Distant) from which it differs in the shape and location of the aedeagal processes (see illustrations, figs. 55–70).

Procandea loretoensis, *new species*

FIGURE 67

Length 20 mm. Pronotum with lateral margins subparallel, disc punctate. Forewings with membrane as in *P. reticulata*, new species, clavus and corium pitted, fourth apical cell with base not more proximal than base of third, plexus as in *P. reticulata*. Posterior femoral setal formula 2:1:1. Male pygofer and plates much as in *P. marcia* (Distant), but plates with more macrosetae, which are located on mesal half of plate; aedeagus as in *P. reticulata*, but with anteapical dorsal processes slender and recurved and with a slightly prolonged, narrow, apical extension of shaft; style and connective much as in *P. reticulata*. Color as in *P. monticola*, new species.

Holotype male, with labels "Iquitos, Peru/F6062" and "H. Bassler/ Collection/Acc. 33591" (AMNH).

This species, from the Department of Loreto, is closely related to *P. reticulata*, but differs in the characters set forth in the key and in the above description.

Procandea exasperatula, *new species*

FIGURE 69

Length of male 16 mm. Forewings with membrane including all of inner apical cell. Male plates extending as far posteriorly as pygofer apex, each with numerous regularly spaced macrosetae and with a number of microsetae along lateral margin; aedeagus short, in lateral aspect with an apical unpaired dorsal process extending dorsally, without paired processes, middle portion of shaft with a flangelike expansion on each side. Color of crown sordid yellow with a broad median black fovea, pronotum dark purplish with obscurely delimited yellow spots, forewing castaneous with large well delimited yellow areas.

Holotype male, Santa Inéz, Ecuador (R. Haensch) (IZP).

This species is much similar to the other species in the genus in external appearance, but differs from all of these in the unpaired apical aedeagal process.

Procandea ochracea, *new species*

FIGURE 65

Length of male 16 mm. Forewings with membrane including all of apical cells. Male pygofer as in *P. furcata*, new species; aedeagus with a pair of elongate apical processes which are branched at their apices. Color paler than other species in the genus; markings of crown

as in *P. peruensis*, new species. Pronotum with dark markings delimiting two spots on basal margin and four behind these across middle of disc; scutellum black with a mid-basal and an apical spot yellow. Color of forewings as in *P. peruensis*.

Holotype male, "Inanfue," Peru (MMB). The specimen had been slightly damaged by dermestids, and the connective is missing as a result.

This species appears to be closely related to *P. andina*, new species, but it can be distinguished readily from the latter and from other species in the genus by the form of the aedeagus. It is known only from the type specimen.

12. Genus CICCUS Latreille

FIGURES 71, 72

Ciccus Latreille, 1829a:221. Type-species: *Cicada adspersa* Fabricius, by subsequent designation of Amyot and Serville, 1843a:572.

Coelopola Stål, 1869a:65. Type-species: *Cicada adspersa* Fabricius, by subsequent designation of Dallas, 1870a:494.

Length 15–19 mm.

Head triangular, varying from slightly- to well-produced, anterior margin angulate to rounded, usually without an M-shaped elevation bordering posterior margin, with a full-length median fovea which is broader in apical half, with or without a longitudinal keel laterad of each ocellus, disc not pubescent; antennal ledges not carinate dorsally in lateral aspect; clypellus produced but not carinate medially; other characters as in *Procandea*.

Thorax with pronotal width less than transocular width of head, lateral margins parallel, disc transversely striate; not pubescent, other characters as in *Procandea*. Forewing with membrane present, not well differentiated, including at least inner half of first apical cell and at least a portion of the remaining apical cells, veins distinct or not, not strongly elevated, clavus and corium coriaceous, with more than four apical cells, with or without a few supernumerary veins on disc of corium before apical cells, wings of female in rest position covering apex of ovipositor; otherwise as in *Procandea*. Hindwing as in *Procandea*. Hindlegs with femoral setal formula 2:0:0; otherwise as in *Procandea*.

Male genitalia: Pygofer in lateral aspect angularly produced, with apex rounded, with a few submarginal microsetae near caudolateral margin, without processes, but with conspicuous processes extending posteriorly from posterior membrane of genital capsule. Plates fused basally or not, extending posteriorly considerably farther than pygofer apex, truncate or acuminate apically, with numerous dispersed microsetae. Style not extending as far posteriorly as apex of connec-

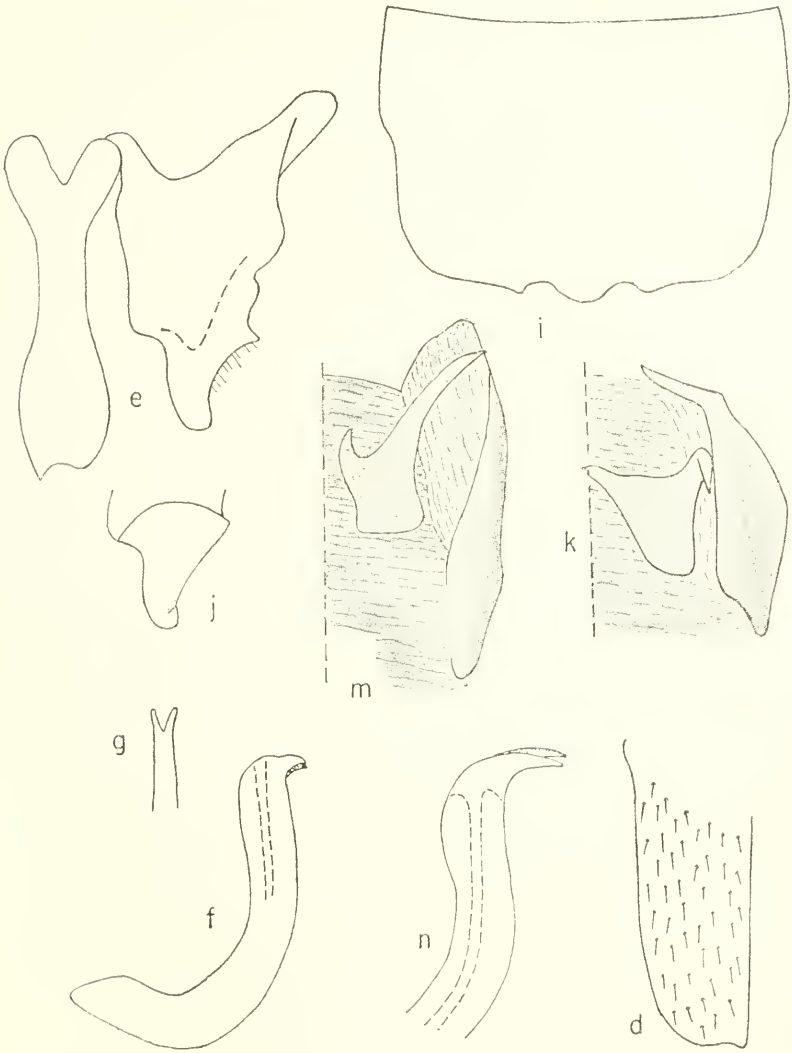


FIGURE 71.—*Ciccus adspersus* (Fabricius) (**a-k** from specimens from British Guiana; **m**, from French Guiana; **n**, from Manáos, Brazil): **j**, style apex, dorsal view; **k** and **m**, pygofer, caudal view; **n**, aedeagal shaft, lateral view.

tive, with distinct preapical lobe, not conspicuously modified at apex, with a few preapical lateral microsetae. Connective Y-shaped; with a single or double median keel. Aedeagus symmetrical, curved gradually posteriorly and dorsally, with a pair of small apical posterior processes. Paraphyses absent (see description of processes from posterior membrane, above).

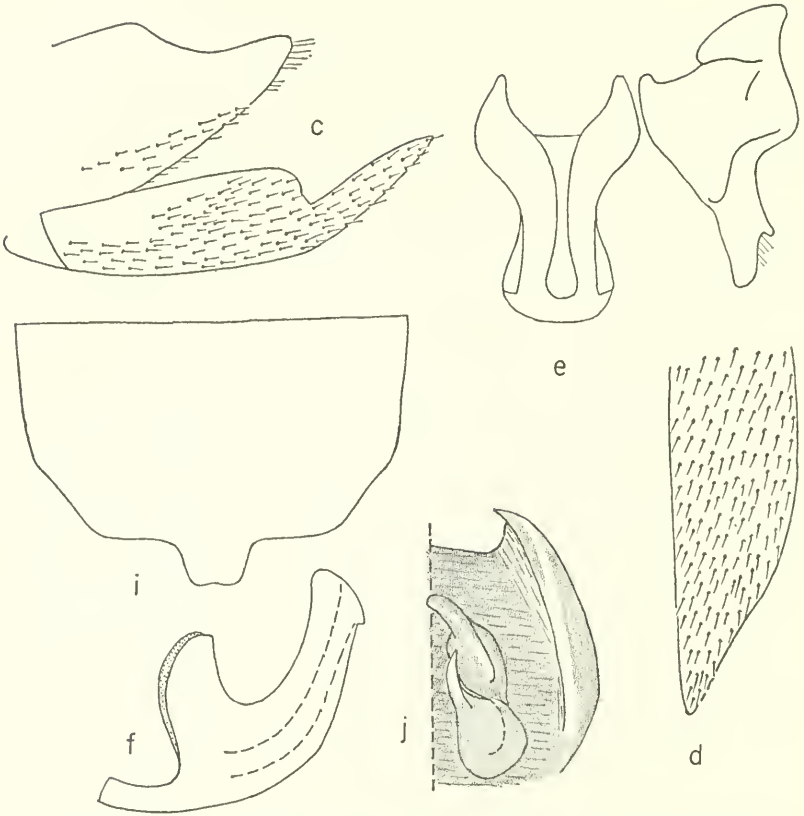


FIGURE 72.—*Ciccus viridivitta* (Walker) (i from specimen from Pará, Brazil; others, from British Guiana): j, male pygofer, posterior view.

Female abdominal sternum VII with posterior margin convex each side of a small median projection.

Specimens belonging to the genus *Ciccus* have been examined from Northern Brazil, Amazonas, French and British Guiana, Ecuador, and Peru. The writer has followed Metcalf in using the nominate species *Cicada adspersa* Fabricius as type of *Ciccus*. This is one of the originally included species but no species was originally selected as type of the genus. Amyot and Serville (1843a:572) redescribed *Ciccus* Latreille and selected *C. adspersus* (Fabricius) as type. There was nothing in the original description of *Ciccus* which prevented the use of *C. adspersus* as type-species, but in the redescription Amyot and Serville stated that the anterior tibiae of both sexes were flattened, a condition which does not occur in true *adspersus*. Thus there are grounds for interpreting this as a misdetermined type-species, as Distant has interpreted it, and perhaps

this problem should be submitted to the International Commission of Zoological Nomenclature.

This genus is closely related to *Procandea* and *Desamera*, in the discussion of which distinguishing characters are treated.

The holotype of *C. atomaria* (Walker) and the lectotypes of *C. punctipennis* (Schmidt) and *C. adspersus* (Fabricius) agree closely with the illustration of *adspersus* (fig. 71). The lectotype of *C. punctulifera* (Melichar) agrees also, except that the apex of the male plate differs slightly in ventral view.

The holotypes of *Ciccus viridivitta* (Walker) and *C. triplaga* (Walker) agree well with the illustrations of *viridivitta* (fig. 72) as does the lectotype of *Cicada canaliculata* Fabricius, which is a preoccupied name.

SPECIES OF CICCUS

adspersus (Fabricius), 1803a:61 (*Cicada*). Fr. Guiana, Br. Guiana, N. Brazil, Ecuador, Peru.

atomaria (Walker), 1851b:792 (*Aulacizes*).

punctulifera (Melichar), 1926a:291 (*Amblydisca*). New synonymy.

punctipennis (Schmidt), 1928a:48 (*Amblydisca*). New synonymy.

viridivitta (Walker), 1851b:794 (*Aulacizes*). Fr. Guiana, Br. Guiana, N. Brazil, NW. Brazil.

triplaga (Walker), 1858a:100 (*Aulacizes*).

KEY TO SPECIES OF CICCUS

Crown with median length less than interocular width; posterior pronotal margin broadly yellow; outer half of inner apical cell coriaceous; male plates truncate apically; median production of abdominal sternum VII of female rounded at apex.

C. adspersus (Fabricius) (fig. 71)

Median length of crown greater than interocular width; posterior margin of pronotum not broadly yellow; inner apical cell entirely membranous; male plates acute apically; female abdominal sternum VII with median projection truncate apically.

C. viridivitta (Walker) (fig. 72)

13. PROCAMA, *new genus*

FIGURE 73

Type-species: *Amblydisca fluctuosa* Fowler, 1898a:211.

Length of male 9–10 mm.

Head very slightly produced, its median length much less than interocular width, anterior margin elevated and thickened, the crown thus rounded to face, ocelli located slightly behind a line between anterior angles of eyes, each about equidistant between adjacent

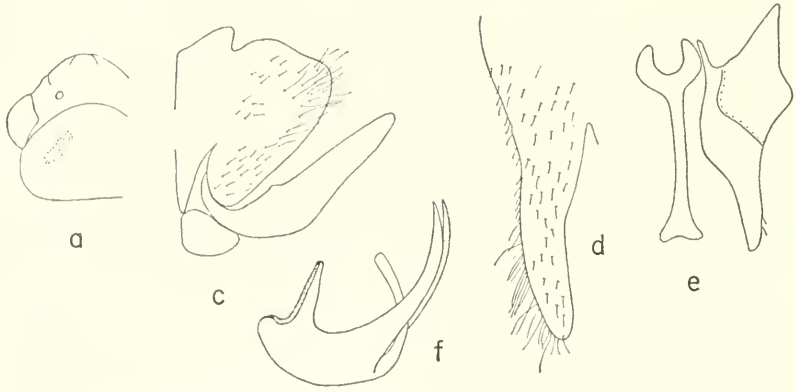


FIGURE 73.—*Procama fluctuosa* (Fowler), specimen from Panama.

eye angle and median line of crown, with or without a distinct M-shaped elevation bordering posterior margin, without a longitudinal carina laterad of each ocellus, with a median fovea which is slightly narrowed in apical portion, disc without setae; antennal ledges not foveate, not carinate dorsally in lateral aspect, with anterior margins steeply declivous; clypeus with a broad median shallow depression which bears an incomplete median carina, muscle impressions distinct; transclypeal suture obsolete; face pubescent below; clypellus produced, not carinate, the contour of its lower half at right angle to profile of clypeus.

Thorax with pronotal width less than transocular width of head, lateral margins parallel, disc transversely rugose and punctate, without pubescence, posterior margin concave, with complete dorsopleural carinae, each of which is curved slightly ventrally behind its anterior end; scutellum transversely striate on posterior portion. Forewing with membrane not distinctly delimited, including all of apical cells, veins slightly elevated and distinct, clavus and corium coriaceous, with four apical cells, the base of fourth slightly more proximal than base of third, without a discal anteapical plexus of veins and without supernumerary anteapical crossveins to costal margin. Hindwing at rest extending almost as far posteriorly as forewing, vein R_{2+3} incomplete. Hindlegs with femoral setal formula 2:0:0; first tarsomere with length less than combined length of second and third.

Male genitalia: Pygofer not strongly produced, rounded apically, with dispersed microsetae over disc, without processes. Plates fused at base, extending posteriorly farther than apex of pygofer, tubular, tapering, with numerous dispersed microsetae. Style extending pos-

teriorly beyond apex of connective, rounded apically, without preapical lobe. Connective elongate, Y-shaped, arms not widely divergent, each much shorter than the elongate stem. Aedeagus with a pair of slender tapering lateral processes which extend posterodorsally much beyond apex of submembranous shaft. Paraphyses absent.

Procama is known only from the type-species, which occurs in Panama. Its affinities are problematical. It is placed close to *Aulacizes* here because of its general external resemblance to that genus and because of the form of the aedeagus. It differs in far too many aspects, however, to suggest a close relationship to *Aulacizes*.

The present interpretation of the identity of the type-species rests on a male specimen from Tolí, Panama, compared with the female lectotype in the British Museum (Natural History). The genitalia of this specimen are as in figure 73.

14. DEPANANA, *new genus*

FIGURE 74

Type-species: *Amblydisca bugabensis* Fowler.

Length 14–15 mm.

Head very slightly produced, median length approximately half interocular width, anterior margin slightly elevated and carinate, ocelli located behind a line between anterior angles of eyes, with a shallow median fovea which is narrowed anteriorly, with a longitudinal carina laterad of each ocellus, disc without pubescence; antennal ledges in lateral aspect without a dorsal carina, anterior margin not steeply declivous; clypeus with a broad, shallow, median concavity; face pubescent laterally and ventrally; clypellus produced and subangulate, contour of its lower portion almost at right angle to profile of clypeus; other characters as in *Procandea*.

Thorax with pronotal width slightly greater than transocular width of head, lateral margins convergent anteriorly, disc transversely rugose, with very short pubescence, posterior margin concave; scutellum with posterior portion transversely rugulose; other characters as in *Procandea*. Forewing with membrane not distinctly delimited, veins distinct but not elevated, texture translucent, with four apical cells, corium without an anteapical, discal plexus of veins or anteapical supernumerary crossveins to costa; otherwise as in *Procandea*. Hindwing as in *Procandea* but with vein R_{2+3} incomplete. Hindlegs with femoral setal formula 2:0:0; other characters as in *Procandea*.

Male genitalia: Pygofer moderately produced and rounded apically, with numerous dispersed microsetae anteapically and parallel to posteroventral margin, without pygofer processes, but with paired large,

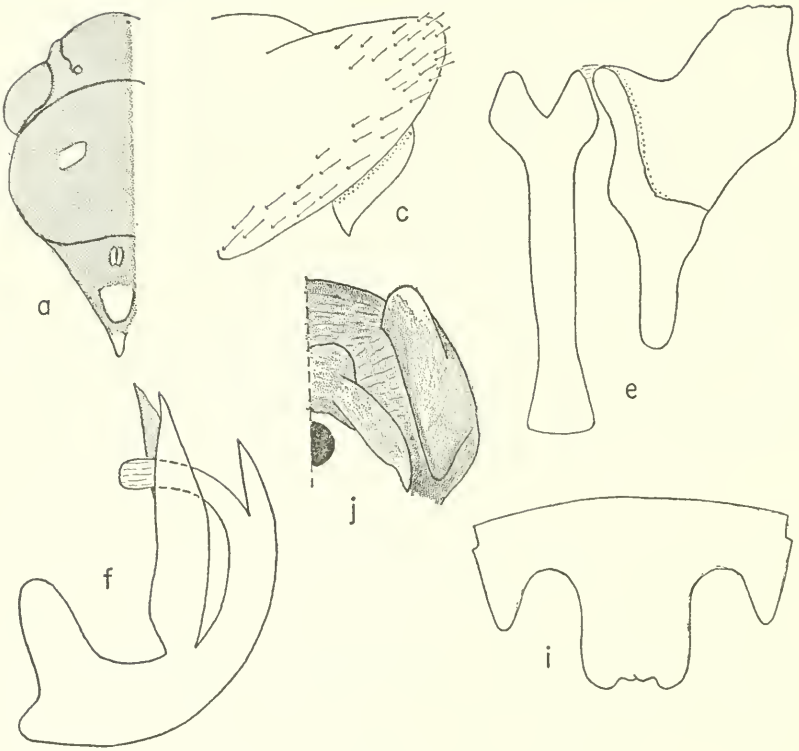


FIGURE 74.—*Depanana bugabensis* (Fowler) (**a** and **i** from lectotype; **c, e, f, j** from specimen from Chiriquí, Panama; plate not shown in **c**): **j**, male pygofer, right side, posterior view (dark area showing location of aedeagus).

conspicuous sclerites in conjunctiva IX–X. Plates fused basally, extending farther posteriorly than pygofer apex, triangular, with numerous dispersed microsetae. Style not extending as far posteriorly as apex of connective, with distinct preapical lobe (not shown in illustration), apex rounded. Connective elongate, Y-shaped, the arms very short and not widely divergent. Aedeagus symmetrical, with an unpaired ventral anteapical process and with a pair of broad, tapering processes arising dorsally on shaft and exceeding shaft apex. Paraphyses absent (note above description of sclerites in conjunctiva).

Female abdominal sternum VII with posterior margin broadly produced at middle in a quadrate lobe which is emarginate apically and with a shorter lateral lobe on each side.

This genus is known only from the type-species, specimens of which have been examined from Panama and Guatemala. *Depanana* is very

closely related to *Desamera*, from which it can be separated by the characters in the key. It is also closely related to *Depanisca*, in the discussion of which distinguishing characters are set forth.

A male specimen compared with the type of *D. bugabensis* (Fowler) and a male compared with the lectotype of *D. postfumata* (Fowler) both had genital structures like those in figure 74.

SPECIES OF DEPANANA

bugabensis (Fowler), 1898a:210 (*Amblydisca*). Guatemala, Panama. New combination.

postfumata (Fowler), 1898a:210. (*Amblydisca*). New synonymy.

15. DEPANISCA, *new genus*

FIGURES 75, 76

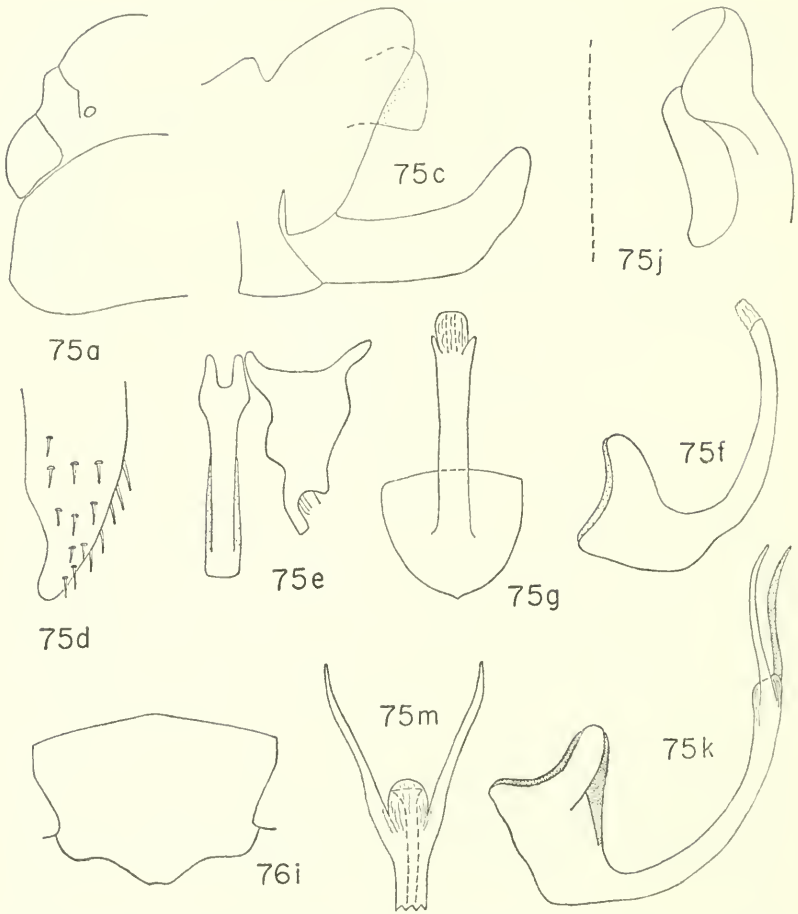
Type-species: *Tettigonia sulcata* Signoret.

Length 10.4–12.1 mm.

Head moderately produced, median length from slightly more than half to seven-tenths interocular width, ocelli located behind a line between anterior eye angles, each slightly closer to median line than to adjacent eye angle, with or without an M-shaped elevation bordering posterior margin; antennal ledges each with a longitudinal sulcus, in lateral aspect carinate dorsally, anterior margins oblique; clypeus with disc depressed or not, clypellus not keeled; otherwise as in *Procandea*.

Thorax with lateral pronotal margins convergent anteriorly, disc rugose and punctate, pubescent or not, posterior pronotal margin weakly or strongly concave; scutellum transversely striate or not on posterior half; otherwise as in *Procandea*. Forewing with or without a membrane, veins obscure or elevated and distinct, surface without pits or punctures, with four apical cells, base of third more proximal than base of fourth, with or without discal supernumerary veins, usually with anteapical supernumerary crossveins to costal margin; other characters as in *Procandea*. Hindwing with vein R_{2+3} incomplete. Hindlegs with femoral setal formula 2:1:0; first tarsomere with length less than combined length of second and third tarsomeres.

Male genitalia: Pygofer in lateral aspect as in *Procandea*, without macrosetae, with a pair of sclerotized lobes on conjunctiva IX–X. Plates extending posteriorly farther than pygofer apex, each subtriangular, with a small number of evenly dispersed macrosetae; otherwise as in *Procandea*. Style not extending as far posteriorly as apex of connective, with distinct preapical lobe, subtruncate apically. Connective elongate, Y-shaped, basal arms very slightly divergent, stem not very broad. Aedeagus slender and elongate, curved gradually



FIGURES 75, 76.—75, *Depanisca sulcata* (Signoret) (**a-j** from lectotype): **j**, male pygofer, right side, posterior view; **k** and **m**, aedeagus (views corresponding to **f** and **g** of lectotype). 76, *D. incarnatula* (Melichar), lectotype.

posterodorsally, with paired anteapical processes. Paraphyses absent (note lobes on conjunctiva IX–X described above).

Depanisca is known only from the type-species and an additional species which is known only from the female. The genus ranges from Venezuela to Ecuador and Bolivia. If I have correctly identified male specimens from Venezuela, the form of the aedeagal apex is dimorphic, with the processes either greatly reduced or well developed, a condition suggestive of that found by Hans Joachim Müller in seasonal polymorphism in *Euscelis* (1947a). *Depanisca* is very closely

related to *Depanana* from which it may be separated by the form of the aedeagus and by the male plates, which are not fused as in *Depanana*. *D. sulcata* (Signoret) has been taken in numbers from sugar cane in Venezuela.

SPECIES OF DEPANISCA

[† Known only from female.]

†*incarnatula* (Melichar), 1926a:294 (*Amblydisca*). Ecuador. New combination.
sulcata (Signoret), 1855a:58 (*Tettigonia*). Venezuela, Bolivia. New combination.

16. Genus AULACIZES Amyot and Serville

FIGURES 77–81

Aulacizes Amyot and Serville, 1843a:571. Type-species: *Tettigonia quadripunctata* Germar, by monotypy.

Length 11–16 mm.

Head moderately produced, with median length equal to or exceeding interocular width, anterior margin slightly elevated and carinate; ocelli located on a line between anterior angles of eyes, each slightly closer to median line than to adjacent eye angle, with an M-shaped elevation bordering posterior margin, with a short longitudinal carina laterad of each ocellus, with a median fovea which is broadened anteriorly, disc without pubescence; antennal ledges with a longitudinal sulcus, in lateral aspect carinate dorsally and with anterior margins steeply declivous; clypeus depressed beneath apex of head, muscle impressions distinct; face finely pubescent below; clypellus not produced, its contour continuing profile of clypeus.

Thorax with pronotal width less than or equal to transocular width of head, lateral margins convergent anteriorly or parallel, posterior two-thirds of pronotal disc transversely rugose and punctate, posterior margin concave, with complete dorsopleural oblique rectilinear carinae; scutellum usually transversely striate on posterior portion. Forewing with membrane variable in extent, veins elevated and distinct, clavus and corium not strongly coriaceous, clavus punctate, with only four apical cells, the base of the fourth located more proximally than base of third, without an anteapical discal plexus of veins and without supernumerary anteapical crossveins to costal margin, the wings at rest concealing apex of ovipositor in female. Hindwing at rest extending almost as far posteriorly as forewing; vein R_{2+3} interrupted. Hindlegs with setal formula 2:0:0; first tarsomere shorter than combined length of second and third.

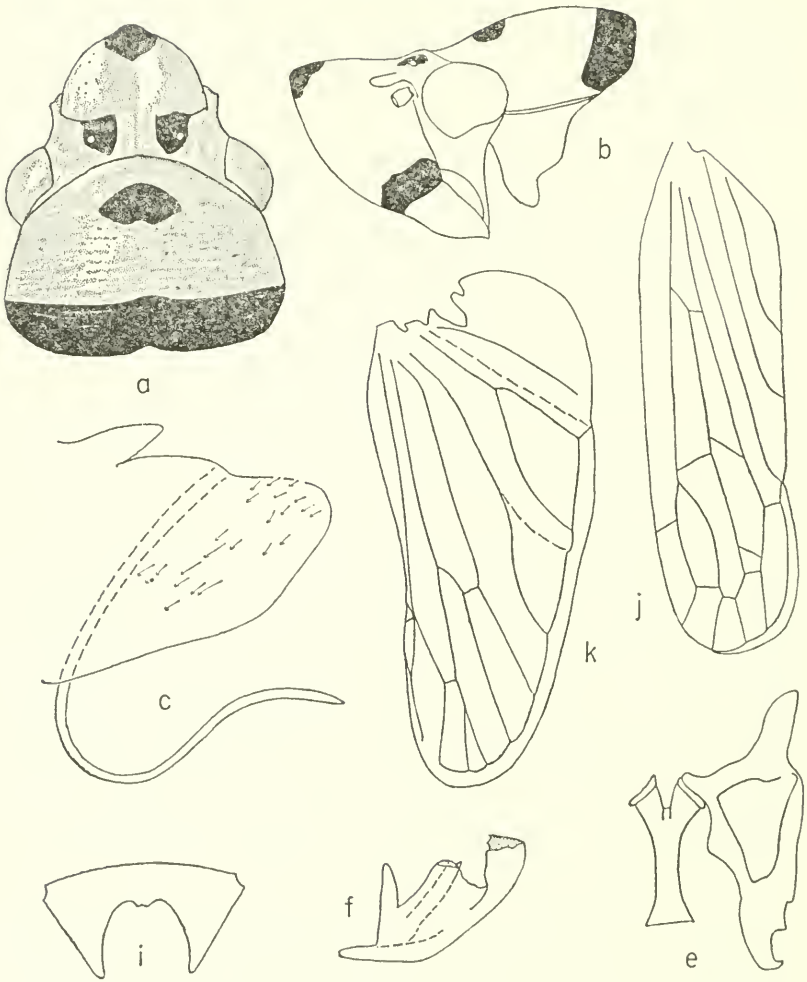
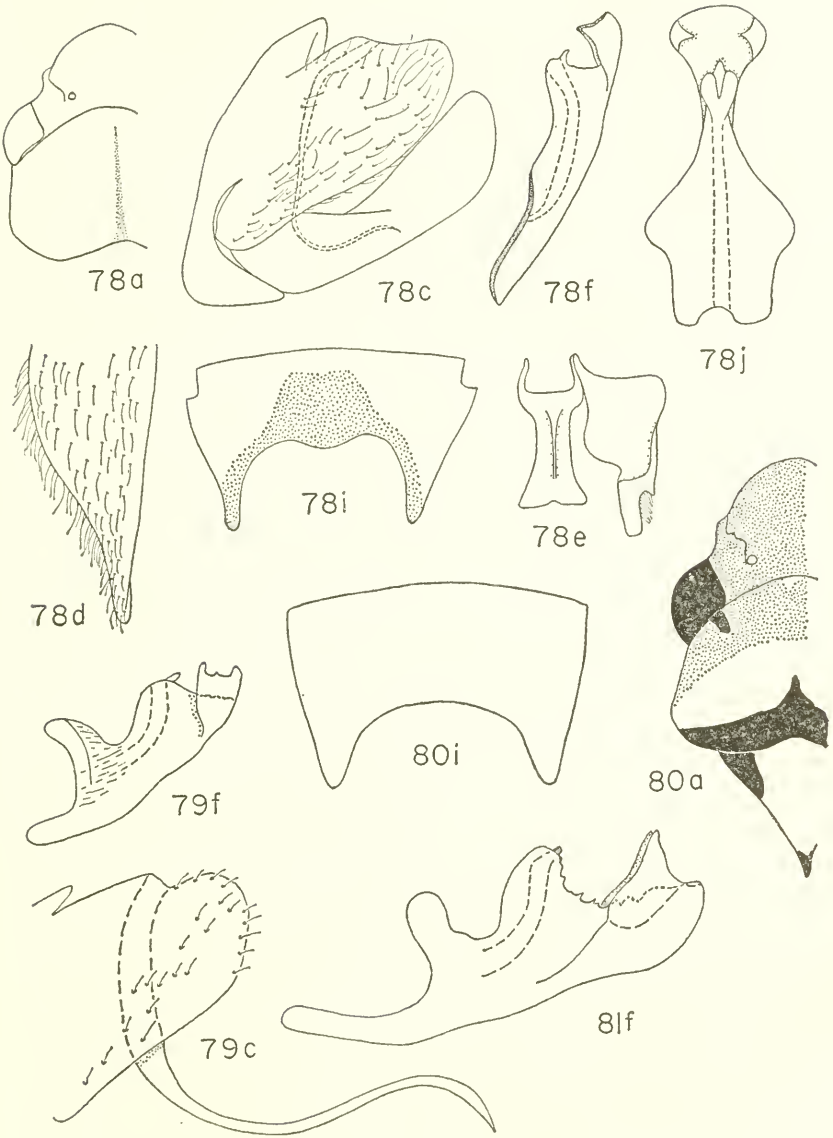


FIGURE 77.—*Aulacizes quadripunctata* (Germar), specimens from southeastern Brazil (plate not shown in c): **j**, forewing; **k**, hindwing.

Male genitalia: Pygofer not strongly produced posteriorly, with dispersed microsetae on disc, with a long slender tapering process arising near middle of dorsal margin, extending ventrally then curved posteriorly. Plates separate throughout their length, extending posteriorly slightly farther than pygofer apex, triangular, with numerous irregularly arranged microsetae. Style extending farther posteriorly than apex of connective, with distinct preapical lobe, apical portion decurved, tip rounded or slightly hooked. Connective narrowly Y-shaped, the arms not widely divergent, stem not keeled. Aedeagus



FIGURES 78–81.—**78**, *Aulacizes obsoleta* Melichar (**a** and **i** from lectotype; others from specimen from Rio Grande do Sul, Brazil): **j**, aedeagus, dorsal aspect. **79**, *A. conspersa* Walker, specimen from Rio Grande do Sul, Brazil, plate not shown in **c**. **80**, *A. basalis* Walker, holotype; in **a**, stippled area brown, unstippled, yellow. **81**, *A. insistans* (Walker), specimen from Minas Geraes, Brazil.

symmetrical, short, with an apical ventral scoop-shaped process which exceeds apex of shaft and which often has its lateral extremities curved dorsomesally to form processes. Paraphyses absent.

Female abdominal sternum VII with posterior margin deeply emarginate, often with a slight convex median process within the emargination.

Specimens belonging in this genus have been examined from Venezuela, southern Brazil, and Argentina. The Venezuela record is possibly an error. It is the type locality of *A. basalis* Walker. All the other specimens examined have been from southern Brazil and Argentina. *Aulacizes* is closely related to *Paraulacizes* and *Pseudometopia*, from both of which it may be distinguished by the form of the aedeagus, which is not inflated and which in *Aulacizes* possesses a ventral scoop-shaped apical process.

The genitalia of the male and the abdominal sternum VII of the female do not appear to offer conclusive specific characters. External characters are variable also, to some degree. For these reasons it has been considered inadvisable to attempt to present a key to species at this time. The reader is cautioned to remember that some of the synonymy in the check list below was made without comparing type specimens of the taxa concerned.

The present interpretation of *A. erythrocephala* (Germar) is based on a specimen (ZIMH) from the Heyer collection and believed to be eligible as lectotype. The female lectotype of *A. clypeata* (Signoret) has the abdominal sternum VII as in the illustration (fig. 77) of *A. quadripunctata* (Germar). A male specimen, closely resembling the lectotype of *A. clypeata*, but with the head more angular, has genitalia like the illustration (fig. 78) of *A. obsoleta* Melichar. The male genitalia of the lectotype of *A. divergens* Schmidt are also as in figure 78. A male of *A. conspersa* Walker, compared with the teneral female lectotype, has genitalia as in figure 79.

SPECIES OF AULACIZES

[*Type not seen. †Known only from female.]

†*basalis* Walker, 1851b:795. Venezuela, S. Brazil.
clypeata (Signoret), 1855b:234 (*Tettigonia*). S. Brazil.
conspersa Walker, 1851b:792. S. Brazil, N. Argentina.
maculata Walker, 1851b:794. New synonymy.
terminalis Walker, 1851b:793. New synonymy.
repanda (Signoret), 1855a:60 (*Tettigonia*). New synonymy.
affinis (Signoret), 1855b:227 (*Tettigonia*).
annuligera (Walker), 1858b:231 (*Proconia*). New synonymy.
persistans (Walker), 1858b:232 (*Proconia*).
maculata var. *nigriceps* Schmidt, 1928c:79. New synonymy.

**conspurcata* Melichar, 1926a:306.
divergens Schmidt, 1928c:78. S. Brazil.
insistans (Walker), 1858b:232 (*Proconia*). S. Brazil.
obtusa Walker, 1858b:239. New synonymy.
obsoleta Melichar, 1926a:306. S. Brazil.
**quadripunctata* (Germar), 1821a:59 (*Tettigonia*). S. Brazil, N. Argentina.
**erythrocephala* (Germar), 1821a:59 (*Tettigonia*). New synonymy.
terminalis (Walker), 1851b:798 (*Diestostemma*).

17. PARAULACIZES, *new genus*

FIGURES 82–90

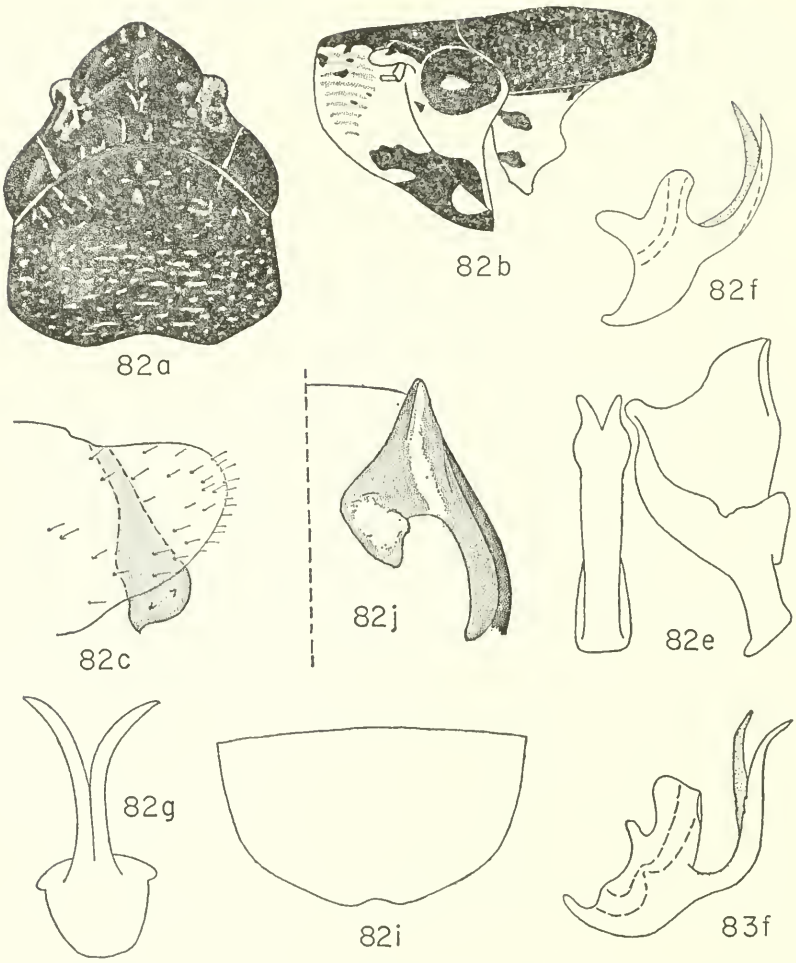
Type-species: *Cicada irrorata* Fabricius.

Length 10.5–13 mm.

Head with median length equal to or less than interocular width, anterior margin slightly carinate (exception: *P. piperata* (Fowler)), ocelli located on or slightly before a line between anterior angles of eyes, each equidistant between adjacent anterior eye angle and median line or slightly closer to latter, with or without an M-shaped elevation bordering posterior margin, with a median fovea (exception: *P. piperata* (Fowler)) which is broadened anteriorly, disc usually pubescent; antennal ledges with or without a longitudinal sulcus, in lateral aspect carinate or not dorsally; clypeus depressed or convex beneath apex of head; other characters as in *Aulacizes*.

Thorax as in *Aulacizes*. Forewing with a membrane which is variable in extent and occasionally not well delimited, veins elevated and distinct, clavus and corium with texture varying interspecifically from translucent to opaque, clavus varying from very sparsely to densely punctate and occasionally with punctures extending into adjacent brachial cell, base of fourth apical cell usually located more proximally than base of third, other characters as in *Aulacizes*. Hindwing at rest extending almost as far posteriorly as apex of forewing; vein R_{2+3} complete (exceptions: *P. thunbergi* (Stål), *P. aurantiaca* (Signoret)). Hindlegs as in *Aulacizes*.

Male genitalia: Pygofer not strongly produced, rounded apically with dispersed microsetae, with a pair of processes arising usually near middle of each side of dorsal margin, extending ventrally and inflated, in caudal aspect appearing as thickenings of conjunctiva IX–X (occasionally not in contact with dorsal margin, appearing then as distinct sclerites). Plates as in *Aulacizes*. Style extending posteriorly as far or nearly as far as apex of connective, with distinct preapical lobe, with apical portion foot-shaped, the "toe" directed mesally (exception: *P. confusa* (Signoret)), with a few serially arranged microsetae beyond apical lobe. Connective elongate, narrowly Y-

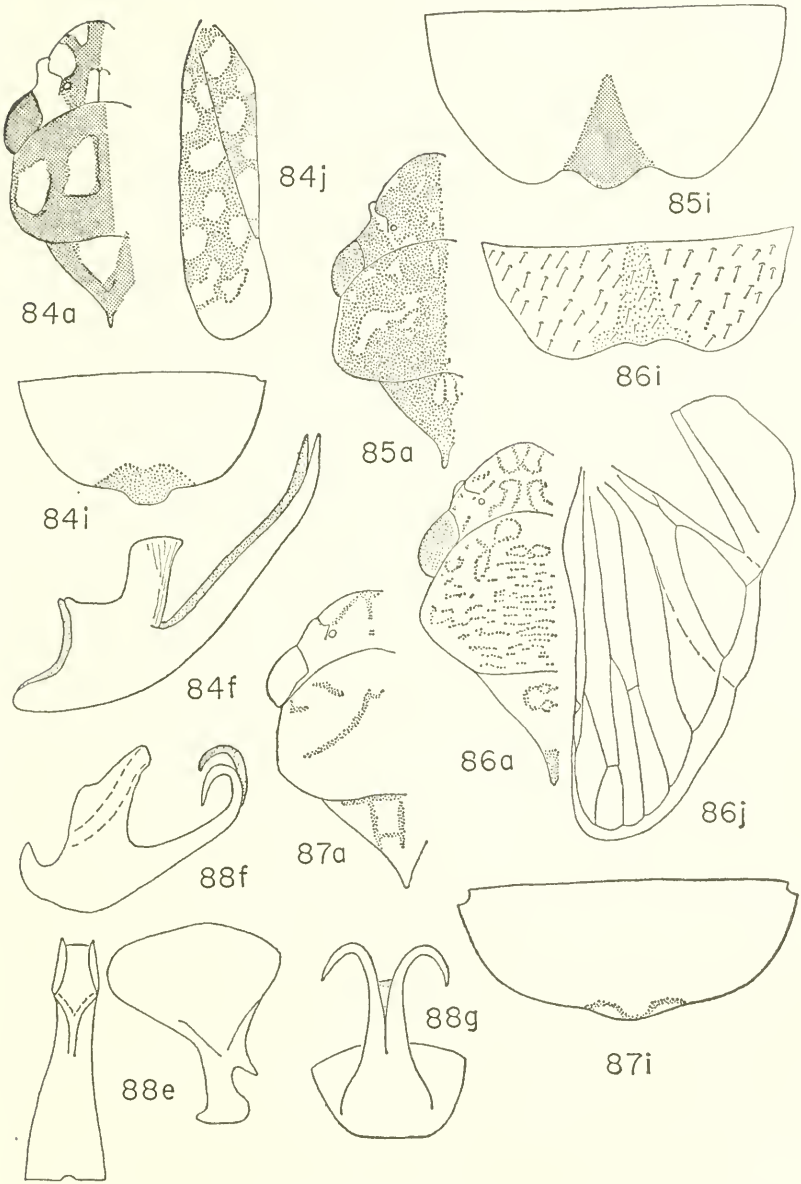


FIGURES 82, 83.—82, *Paraulacizes irrorata* (Fabricius) (**a** and **b** from specimen from Virginia; **c-g, j,** from Florida (plate not shown in **c**); **i,** from Maryland): **j,** male pygofer, posterior view. **83,** *P. piperata* (Fowler), topotype.

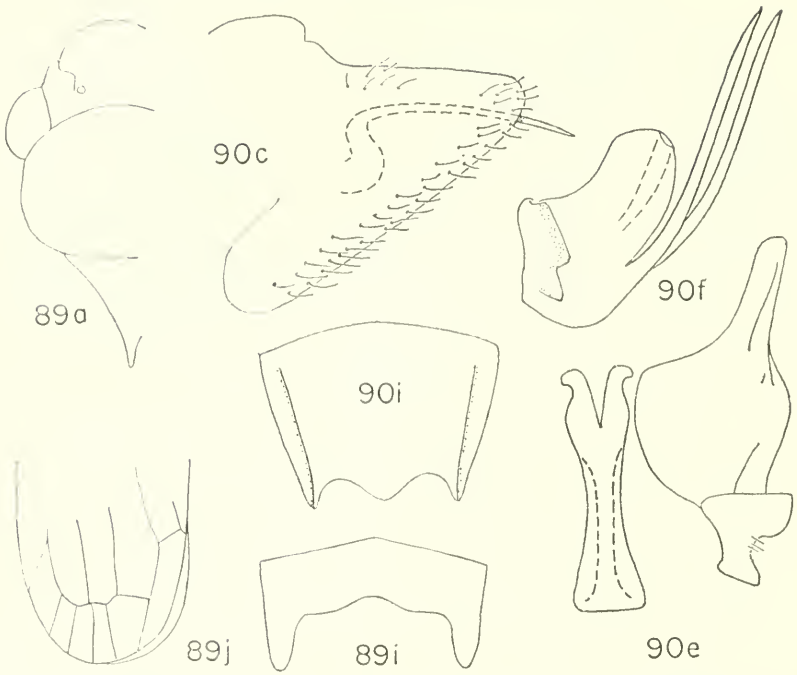
shaped with stem much longer than slightly divergent arms. Aedeagus symmetrical, shaft very short with pair of slender, tapering ventral processes which greatly exceed shaft apex. Paraphyses absent.

Female abdominal sternum VII variable interspecifically.

Species of *Paraulacizes* are known from North and Central America. The genus is very closely related to *Aulacizes*, from which it may be distinguished most readily by the usually inflated form of its pygofer processes and by the form of its aedeagal processes. The identity of



FIGURES 84–88.—**84**, *Paraulacizes thunbergi* (Stål), from lectotype (except **f**, which is a Nicaraguan specimen): **j**, forewing. **85**, *P. sparsa* (Fowler), holotype. **86**, *P. figurata* (Fowler) (**a** and **i** from lectotype of *P. albidipennis* (Fowler)): **j**, hindwing. **87**, *P. confusa* (Signoret), from the lectotype of *P. munda* (Fowler). **88**, *P. mutans* (Signoret), specimen from Guatemala.



FIGURES 89, 90.—**89,** *Paraulacizes lugubris* (Fowler), lectotype: **j,** apex of forewing. **90,** *P. panamensis* (Fowler), specimen from Panama; plate not shown in **c** (process illustrated arises in conjunctiva IX–X).

P. aurantiaca (Signoret), as interpreted here, rests on a Fowler determination in the British Museum (Natural History). It is possible that this should preëmpt *P. thunbergi* (Stål), because the species both have an interrupted vein R_{2+3} in the hindwing, and the male genitalia are identical. *P. ochracea* (Walker) is placed in synonymy under *aurantiaca* on the basis of a comparison of Walker's holotype with Signoret's original description.

P. confusa (Signoret) is not included in the key. The lectotype agrees fairly well with the original illustration. The male genitalia of this species are as in the illustration (fig. 88) of *P. mutans* (Signoret) except that the apex of the style is not "toed in." An examination of the female lectotype of *P. munda* (Fowler) indicates that Melichar was correct in placing this name in synonymy under *P. confusa* (Signoret).

The holotype of *P. sparsa* (Fowler), in RMS, bears labels "Guatem." and "Aulacizes/sparsa Fowler/Type" and "Typus." It is a female. The writer has seen an additional female from Oaxaca, Mexico (BM).

P. lugubris (Fowler) is not included in the following key, and I am

uncertain as to its proper generic placement. It and its synonym, *P. latipennis* (Melichar) are each known from a single female.

P. irrorata (Fabricius) is retained here for the common widespread North American species of the genus, in spite of the fact that *P. nigripennis* (Fabricius) has page priority. Metcalf (1965a:632) considered the latter as the valid name, presumably because of page priority. The Metcalf Catalogue (loc. cit.) indicates that Van Duzee (1894a:269) was the first to recognize the synonymy, and he used *irrorata* as the valid name, an action in which he was followed by a majority of subsequent writers. As noted in the following check list, I have not seen the type of *Cicada nigripennis* Fabricius. There are no specimens of it in the Fabrician collections in Copenhagen.

The lectotype of *P. albidipennis* (Fowler) has the abdominal sternum VII somewhat different from that of the lectotype of *P. figurata* (Fowler), but the difference is believed to be intraspecific.

The male genitalia of the lectotype of *P. mutans* (Signoret) agree with the specimen illustrated in figure 88, except that the base of the style has an anterior apodeme. The holotype of *P. consistens* (Walker) agrees with the present interpretation of *P. mutans* (Signoret), as do the holotype of *P. obliqua* (Walker) and lectotype of *P. invidenda* (Fowler).

The present interpretation of *P. panamensis* (Fowler) is based on a dissected male specimen compared with the undissected male lectotype.

SPECIES OF PARAULACIZES

[*Type not seen.]

aurantiaca (Signoret), 1855b:225 (*Tettigonia*). Mexico, S. Mexico. New combination.

ochracea (Walker), 1858b:244 (*Ciccus*).

confusa (Signoret), 1855a:58 (*Tettigonia*). Mexico, S. Mexico. New combination.

munda (Fowler), 1899b:232 (*Oncometopia*).

figurata (Fowler), 1898a:216 (*Aulacizes*). NW, W., and Central Mexico; Costa Rica. New combination.

albidipennis (Fowler), 1899a:217 (*Aulacizes*). New synonymy.

irrorata (Fabricius), 1794a:33 (*Cicada*). SE. and Central USA; Mexico. New combination.

**nigripennis* (Fabricius), 1794a:32 (*Cicada*).

rufiventris (Walker), 1851b:796 (*Aulacizes*).

guttata (Uhler), 1884a:248 (*Aulacizes*).

lugubris (Fowler), 1898a:210 (*Amblydisca*). Costa Rica, Panama. New combination.

latipennis (Melichar), 1926a:293 (*Amblydisca*). New synonymy.

mutans (Signoret), 1855b:228 (*Tettigonia*). W. and S. Mexico, Guatemala, Costa Rica. New combination.

consistens (Walker), 1858b:226 (*Proconia*).

obliqua (Walker), 1858b:239 (*Aulacizes*).

invidenda (Fowler), 1898a:216 (*Aulacizes*). New synonymy.

panamensis (Fowler), 1899a:219 (*Aulacizes*). S. Mexico, Costa Rica, Panama. New combination.

piperata (Fowler), 1898a:215 (*Aulacizes*). S. Mexico. New combination.

**pollinosa* (Fowler), 1899a:218 (*Aulacizes*). Mexico, Guatemala. New combination.

sparsa (Fowler), 1899a:218 (*Aulacizes*). S. Mexico, Guatemala. New combination.

thunbergi (Stål), 1864a:79 (*Aulacizes*). S. Mexico, Nicaragua, Costa Rica. New combination.

KEY TO SPECIES OF PARAULACIZES

Not included: *lugubris* (Fowler) (fig. 89).

1. Hindwings with vein R_{2+3} incomplete 2
   Hindwings with vein R_{2+3} entire. 3
2. Forewings marked with yellow or orange spots.
   P. thunbergi (Stål) (fig. 84)
   Forewings orange, not so marked. . . . **P. aurantiaca** (Signoret)
3. Forewing with yellow costal markings in basal half 4
   Forewing without such markings. 6
4. Forewing with fine yellow irrorations 5
   Forewing with coarse yellow markings.
   P. sparsa (Fowler) (fig. 85)
5. Head with median length of crown more than half transocular width (Central America) . . . . . **P. pollinosa** (Fowler)
   Head with median length of crown less than half transocular width (North and Central America) . **P. irrorata** (Fabricius) (fig. 82)
6. Crown of head without a median fovea.
   P. piperata (Fowler) (fig. 83)
   Crown of head with a median fovea. 7
7. Face not concave mediodorsally, in lateral aspect strongly swollen; crown of head marked only with a black median stripe.
   P. confusa (Signoret) (fig. 87)
   Face with a mediodorsal concavity, in lateral aspect not strongly swollen; crown of head not so marked. 8
8. Robust species, forewings coriaceous and with short setae . . . 9
   Slender species, forewings translucent and without setae.
   P. panamensis (Fowler) (fig. 90)
9. Forewing with an oblique vitta crossing claval suture in basal half.
   P. mutans (Signoret) (fig. 88)
   Forewing without such a vitta . . . **P. figurata** (Fowler) (fig. 86)

18. Genus PSEUDOMETOPIA Schmidt

FIGURES 91–98

Pseudometopia Schmidt, 1928c:74. Type-species: *P. appendiculata* Schmidt, by original designation and monotypy.

Length 11.5–15 mm.

Head with median length much less than interocular width, anterior margin truncate or slightly concave in dorsal aspect, rounded to face, not carinate, each ocellus usually closer to median line than to adjacent anterior angle of eye; clypeus inflated in lateral aspect, flattened or concave medially; other head characters as in *Aulacizes*.

Thorax with pronotal width less than, equal to, or greater than transocular width of head, posterior two-thirds of disc transversely rugose and occasionally punctate, posterior margin rectilinear or slightly concave, in lateral aspect with oblique dorsopleural carinae which are usually incomplete; scutellum transversely rugose on posterior portion; otherwise as in *Aulacizes*. Forewing as in *Aulacizes* except that texture is often strongly coriaceous, and that there may be a few discal supernumerary crossveins. Hindwing with vein R_{2+3} entire, otherwise as in *Aulacizes*. Hindlegs as in *Aulacizes*.

Male genitalia: Pygofer as in *Aulacizes* (apex subangulate in *P. appendiculata* Schmidt). Plates as in *Aulacizes*. Style usually extending posteriorly about as far as apex of connective, usually with distinct preapical lobe, rounded or slightly pointed at apex. Connective Y-shaped, the arms distinctly or only slightly divergent, usually not much shorter than stem, which is not keeled medially. Aedeagus symmetrical, appearing inflated in caudoventral aspect, without basal processes. Paraphyses absent.

Female abdominal sternum VII variable interspecifically.

Pseudometopia is closely related to *Aulacizes*, from which it can be distinguished by its more robust appearance, its lack of an apical carina on the head, the crown curving gradually to the face, by the inflated clypeus and by the inflated form of the aedeagus. One specimen of *P. amblardii* (Signoret) in the USNM was collected on "Kenaf." Species of the genus occur in Trinidad Island, Venezuela, Colombia, Ecuador, Peru, Bolivia, Paraguay, Brazil, and Argentina. The original description listed *P. amblardii* (Signoret) from Bolivia, but the lectotype bears a "Mexico" locality label. Probably it was mislabeled. The lectotype female of *P. cleasa* (Distant) agrees with the illustrations here. The male lectotype of *P. subsidaria* (Melichar) has genitalia like those illustrated here.

In a recent paper, I selected a lectotype of *P. dufouri* (Signoret), noting that some markings appeared to have been added with a brush. At that time, no specimens with the markings of Signoret's original

illustration had been seen. Since then, specimens from Venezuela which agree with the original illustration have come to hand. They are not conspecific with the lectotype. The lectotype should be set aside, and a petition to the International Commission of Zoological Nomenclature is being prepared to request this. *Psuedometopia dufouri* (Signoret), as treated here, is the genuine *dufouri*, not Young's misdetermination (lectotype) which is actually *P. phalaesia* (Distant), an Andean species known presently from Colombia, Peru, and Bolivia.

In the key, *P. separata* (Signoret) is not included because no specimens have been seen. *P. amblardii* var. *scutellaris* (Schmidt) is known only from the teneral female type (IZP) of which the abdominal sternum VII is as in typical *P. amblardii* (Signoret).

The present interpretation of *P. phalaesia* (Distant) is based on a male specimen compared with the female lectotype in the British Museum. This specimen was conspecific with the male lectotype of *P. dufouri* var. *abdominalis* (Schmidt).

The identity of *P. latifascia* (Walker) rests on a male from Trinidad Island, compared with the Venezuelan female lectotype. The genitalia of the male are as in *P. phalaesia* (Distant) except for the aedeagus, which is illustrated in figure 92.

SPECIES OF PSEUDOMETOPIA

[†Known only from females. §No specimens seen.]

amblardii (Signoret), 1855a:53 (*Tettigonia*). Mexico (?), Colombia, Ecuador, Peru, Bolivia, SE. and Central Brazil, Paraguay, Argentina. New combination.

cleasa (Distant), 1908b:75 (*Aulacizes*). New synonymy.

subsidaria (Melichar), 1926a:304 (*Aulacizes*). New synonymy.

maculipennis (Schmidt), 1928c:72 (*Centrometopia*). New synonymy.

†*amblardii* var. *scutellaris* (Schmidt), 1928c:73 (*Centrometopia*).

appendiculata Schmidt, 1928c:74. Colombia.

dufouri (Signoret), 1855a:55 (*Tettigonia*). Colombia, Venezuela. New combination.

irenae, new species. Peru, Bolivia.

latifascia (Walker), 1851b:796 (*Aulacizes*). Trinidad Is., Venezuela, Peru, Brazil. New combination.

latifasciata var. *angustifasciata* (Melichar), 1925a:403 (*Centrometopia*).

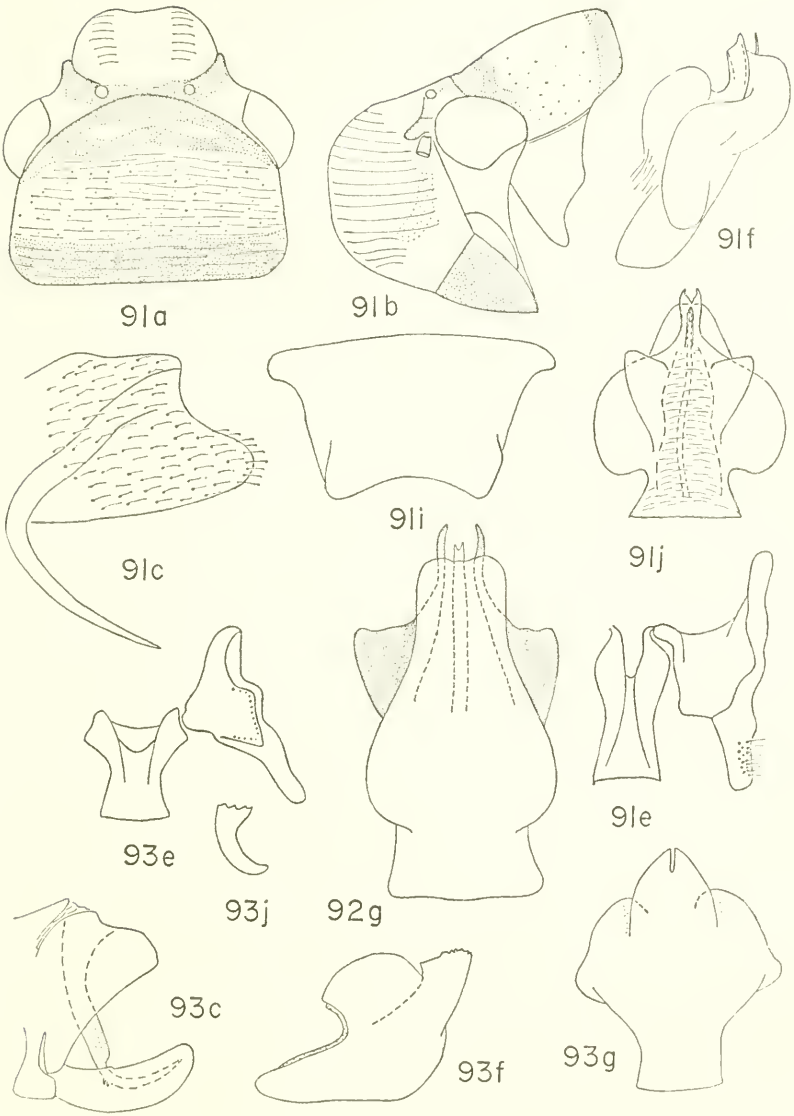
phalaesia (Distant), 1908b:74 (*Aulacizes*). Colombia, Peru, Bolivia. New combination.

dufouri var. *abdominalis* Schmidt, 1928c:72 (*Centrometopia*). New synonymy.

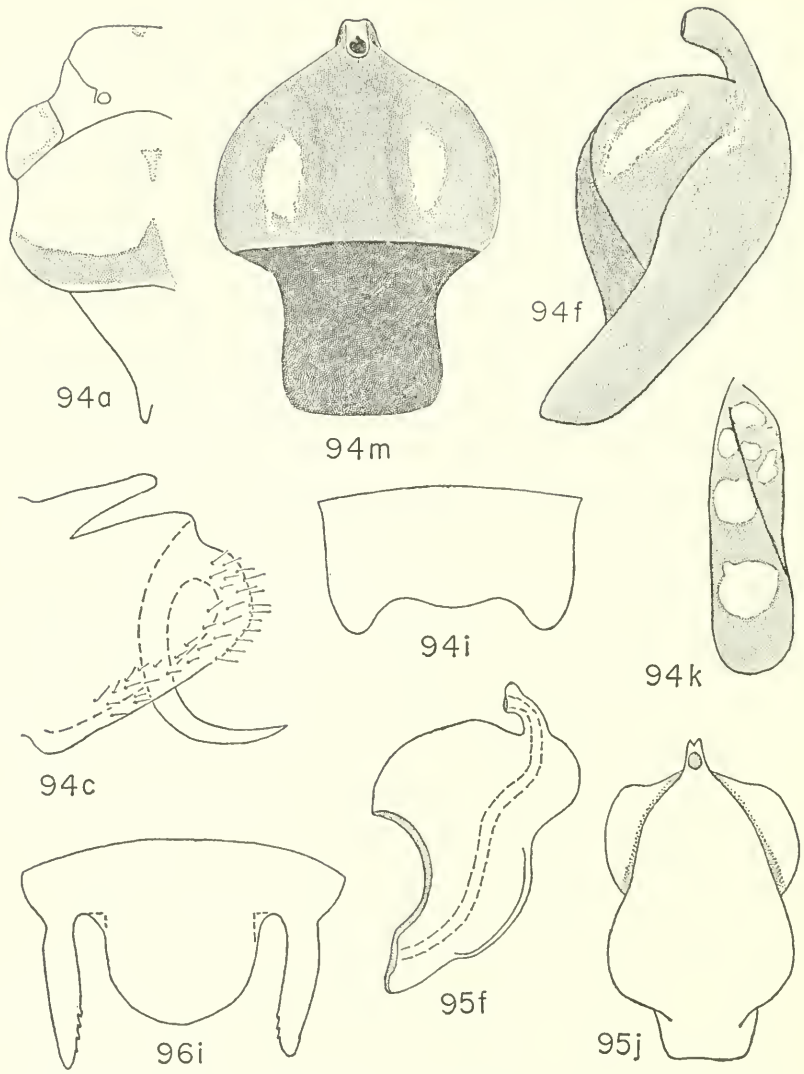
†*sculptilis* (Osborn), 1926b:165 (*Aulacizes*). Peru, Bolivia. New combination.

§*separata* (Signoret), 1854a:54 (*Tettigonia*). New combination.

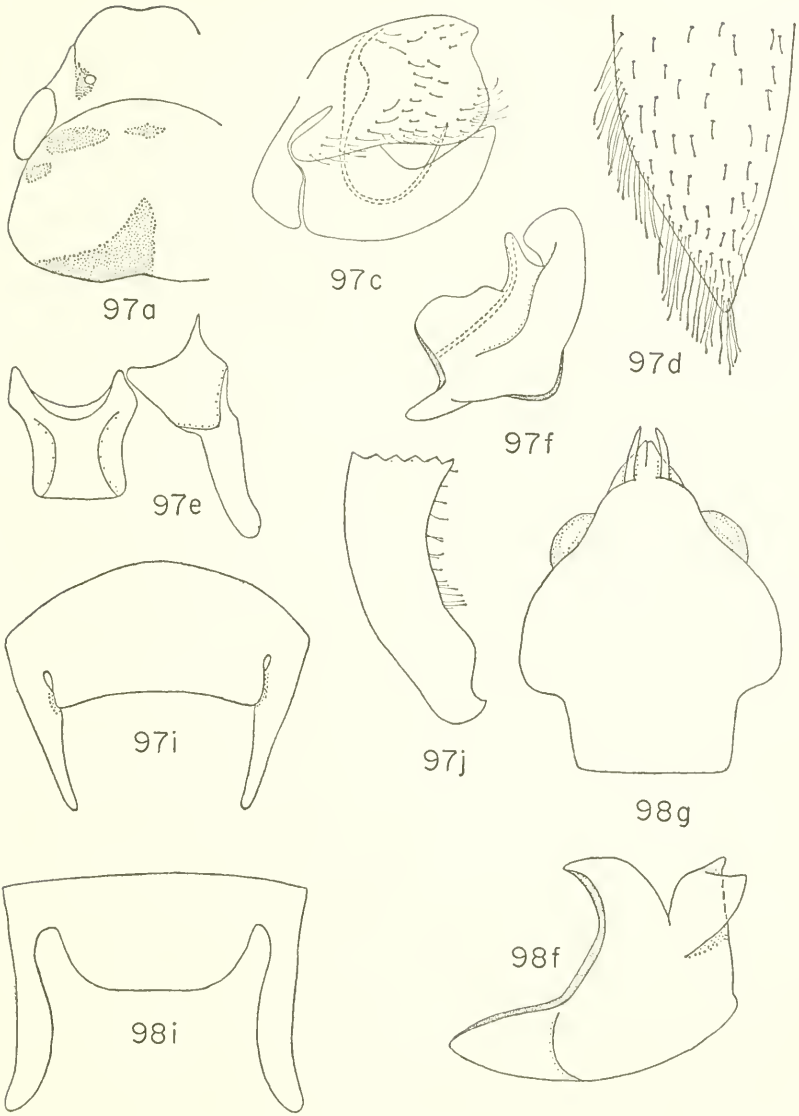
transversa, new species. Brazil.



FIGURES 91–93.—**91,** *Pseudometopia phalaesia* (Distant) (**i** from specimen from Bolivia; others, from Tingo María, Peru; plate not shown in **c**): **j,** aedeagus, dorsal view. **92,** *P. latifascia* (Walker), specimen from Ihiranga, Brazil. **93,** *P. appendiculata* Schmidt, lectotype: **j,** style apex, lateral view.



FIGURES 94–96.—**94,** *Pseudometopia amblardii* (Signoret) (**a, i, k** from lectotype of *P. maculipennis* (Schmidt); others from specimen from Misiones, Argentina; plate not shown in **c**): **m,** aedeagus, anterior view. **95,** *P. transversa,* new species: **j,** aedeagus, anterior view. **96,** *P. sculptilis* (Osborn).



FIGURES 97, 98.—**97**, *Pseudometopia irenae*, new species: **a-f, j** from holotype; **i** from specimen from Callanga, Peru. **98**, *P. dufouri* (Signoret), specimens from Venezuela.

KEY TO SPECIES OF PSEUDOMETOPIA

Not included: *separata* (Signoret) and *amblardii* var. *scutellaris* Schmidt.

1. Forewings at rest with two broad yellow transverse bands . . . 2
   Forewings without yellow transverse bands 3
2. Aedeagus in caudoventral aspect with ventral lobe truncate apically. . . . . **P. latifascia** (Walker) (fig. 92)
   Aedeagus in caudoventral aspect with ventral lobe tapered gradually to aedeagal shaft (fig. 95).
   P. transversa, new species
3. Forewings marked with large pale spots.*
   P. amblardii (Signoret) (fig. 94)
   Forewings not so. 4
4. Forewing with a basal spot bordered by castaneous.
   P. phalaesia (Distant) (fig. 91)
   Forewing without such a spot, female abdominal sternum VII with an elongate lobe on each side 5
5. Males (male of *P. sculptilis* (Osborn) unknown) 6
   Females. 8
6. Aedeagus in lateral aspect with shaft anteapical, anterior to a ventral apical lobe (fig. 97) . . **P. irenae**, new species (p. 105)
   Aedeagus in lateral aspect with shaft apical (fig. 93) 7
7. Aedeagus in lateral aspect with apex of shaft not concealed.
   P. dufouri (Signoret) (fig. 98)
   Aedeagus in lateral aspect with shaft concealed.
   P. appendiculata Schmidt (fig. 93)
8. Abdominal sternum VII with median lobe produced and convex.
   P. sculptilis (Osborn) (fig. 96)
   Abdominal sternum VII with median lobe truncate 9
9. Pronotum with two transverse dark linear markings, connected by a median dark line. . . . . **P. dufouri** (Signoret) (fig. 98)
   Pronotum not so marked . . . . **P. irenae**, new species (p. 105)
   P. appendiculata Schmidt (fig. 93)

Pseudometopia transversa, *new species*

FIGURE 95

Length of male 12.5 mm. Clypeus slightly concave medially. Thorax with pronotal width less than transocular width of head, lateral margins slightly convergent anteriorly, posterior two-thirds of disc transversely rugose and punctate, posterior margin shallowly concave,

*Spots lacking in teneral specimens. See genitalia illustrations.

with oblique incomplete dorsopleural carinae. Forewings strongly coriaceous, with a few discal supernumerary crossveins, membrane hyaline, including only apical portions of apical cells. Male with style extending posteriorly much farther than apex of connective, without preapical lobe, apex acute; connective with arms only slightly divergent, stem longer than arms. Crown yellow, with a spot at apex of each antennal ledge and a diagonal spot behind each ocellus, black; pronotum with a median and two lateral transverse spots on basal third and a broad posterior marginal stripe, black; forewings black, at rest with a broad transverse band across apices of clavi and narrowed mesally, yellow; face entirely yellow.

Holotype male, "Jacareacanga," Pará [Brazil], October 1959 (M. Alvarenga), in USNM.

This species is closely related to *P. latifascia* (Walker) in color and in male genitalia. It differs in the characters mentioned in the key.

Pseudometopia irenae, *new species*

FIGURE 97

Length of male 11.5–12.0 mm.; of female 12.0 mm. Thorax with pronotal width greater than transocular width of head, dorsopleural carinae complete. Forewings usually without discal supernumerary crossveins. Other structural characters as in *P. transversa*, new species. Female abdominal sternum VII with a truncate median and two slender, longer lateral lobes on posterior margin. Crown yellow, with or without a median black stripe, with a variable oblique black marking including ocellus on each side; pronotum yellow to pinkish (type) with a band subtending anterior margin and a posterior marginal band, castaneous, the latter occasionally (type) with an angular anterior projection; scutellum and base of forewings castaneous, remainder of forewings dull brown except for smoky anteapical transverse band; face yellow, lower portion of clypeus, all of clypellus and at least lower portion of genae black, latter occasionally entirely black.

Holotype male, Chanchamayo, Peru, near San Ramón, 25 July 1960 (Young and Ramirez), on indefinite loan to USNM from NCS. Additional specimens in NCS from Chanchamayo, Callanga, and Santa Isabel, Peru, and from an unknown locality in Bolivia; and in other collections from Chaco, Coroico and San Antonio, Bolivia, and from Callanga and Tarma, Peru.

This species is named in honor of the author's wife, Irene, who has spent many hours assisting with various preliminary phases of this work.

P. irenae, new species, is closely related to *P. sculptilis* (Osborn), but has less conspicuous pronotal punctures, complete dorsopleural

thoracic carinae, and a broader anteapical smoky band which includes the apical portions of the anteapical cells. It is also very close to *P. dufouri* (Signoret) and *P. appendiculata* Schmidt in the structure of the female abdominal sternum VII, from both of which it can be separated by the characters of the aedeagus (see figs. 93 and 98). The median lobe of the abdominal sternum VII of the female is convex in *P. sculptilis;* truncate in *P. irenae.*

19. PROCONOSAMA, *new genus*

FIGURES 99–104

Type-species: *Aulacizes alalia* Distant.

Length 11–14.5 mm.

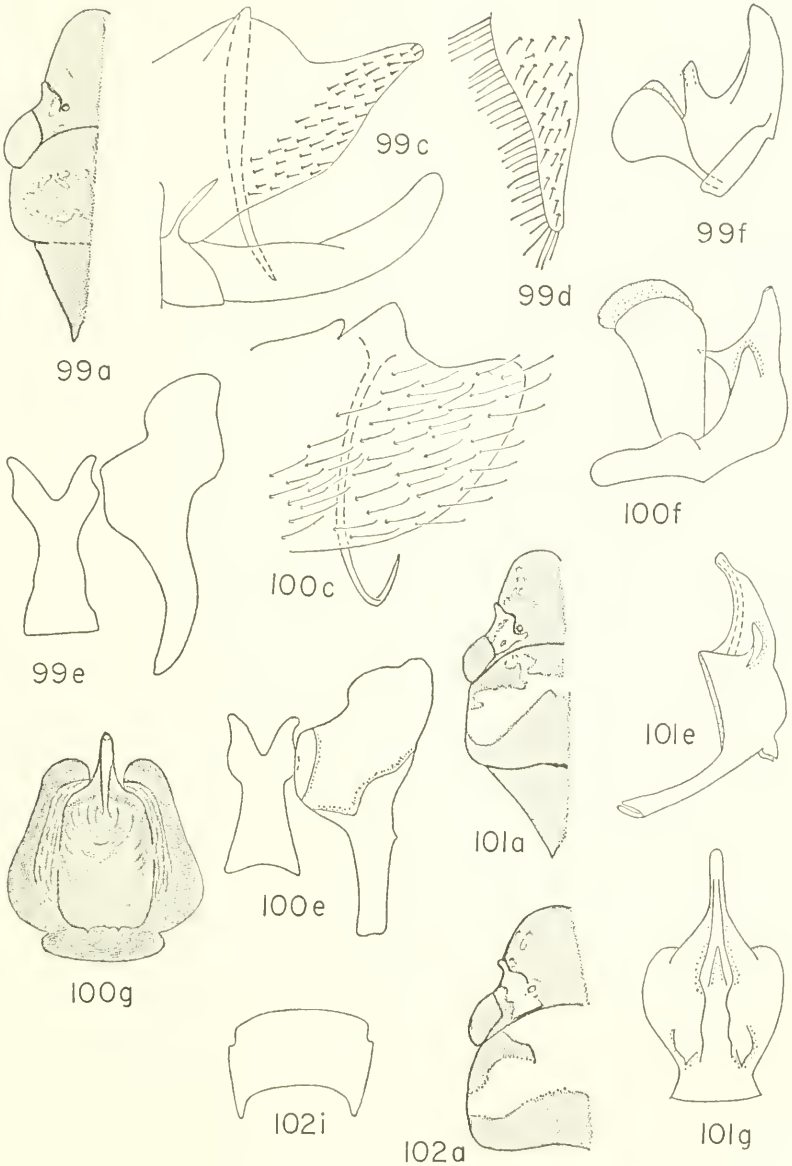
Head strongly produced, anterior margin very slightly elevated and carinate, ocelli located on or slightly behind a line between anterior angles of eyes, surface finely pubescent; antennal ledges not foveate, carinate dorsally in lateral aspect, with anterior margins steeply declivous or not; otherwise as in *Aulacizes.*

Thorax with pronotal width greater than transocular width of head, lateral margins convergent anteriorly, posterior portion of surface transversely rugose or rugose and punctate, surface without pubescence, with complete dorsopleural carinae which are arched ventrally; otherwise as in *Aulacizes.* Forewing with membrane present and distinctly delimited or not from remainder of wing, veins usually elevated and distinct, clavus and corium opaque, usually without a discal anteapical plexus of veins; otherwise as in *Aulacizes.* Hindwing and hindlegs as in *Aulacizes.*

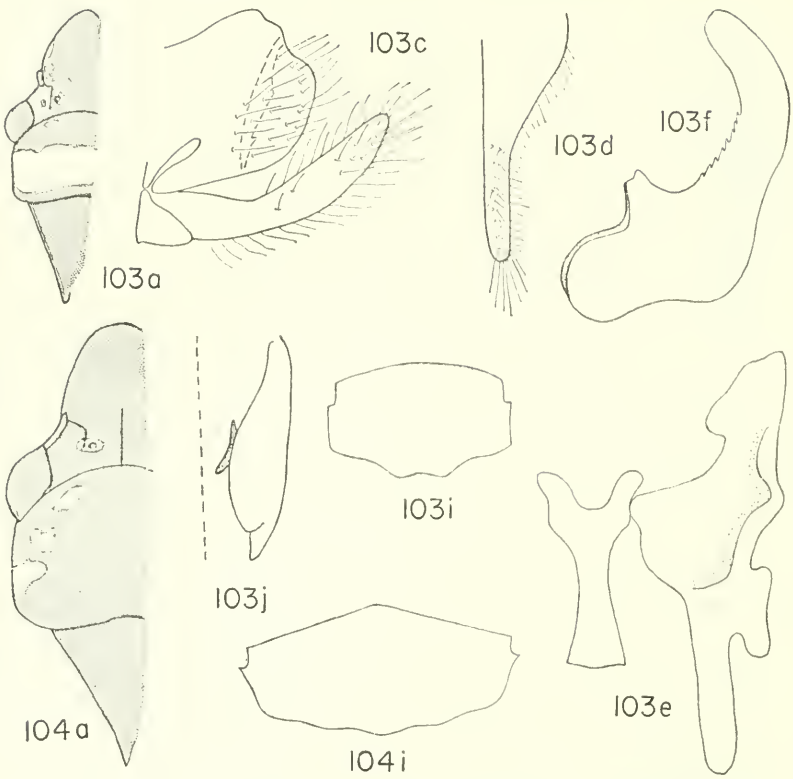
Male genitalia: Pygofer not strongly produced, apex rounded or angulate, with numerous dispersed microsetae, with a process arising preapically on dorsal margin and extending ventrally, acute or branched at apex. Plates separate throughout their length, extending posteriorly slightly farther than pygofer apex, triangular, with numerous dispersed microsetae. Style extending posteriorly farther than apex of connective, with or without distinct preapical lobe, truncate, acute, or rounded apically. Connective Y-shaped, with arms not widely divergent, the stem gradually widened apically, not keeled. Aedeagus symmetrical, shape variable interspecifically, with or without processes. Paraphyses absent.

Female abdominal sternum VII much broader than long, apical margin variable interspecifically.

Species of this genus are known from Colombia, Ecuador, Peru, and Bolivia. *Proconosama* is related to *Aulacizes,* from which it can be dis-



FIGURES 99–102.—**99,** *Proconosama alalia* (Distant), specimen from Yungas de la Paz, Bolivia; hind pronotal margin damaged by pin in **a.** **100,** *P. eluta,* new species, holotype; plate not shown in **c.** **101,** *P. columbica* (Signoret), from lectotype of *P. integra* (Melichar). **102,** *P. haenschi* (Melichar), lectotype (unshaded area of head maroon; of thorax, yellow).



FIGURES 103, 104.—**103,** *Proconosama misella* (Melichar) (a and i from lectotype, others from specimen from Bolivia): j, pygofer, right side, posterior view. **104,** *P. aemilia* (Distant), lectotype.

tinguished by the form of the aedeagus, which lacks the ventral anteapical scooplike process of *Aulacizes*, by its much shorter pygofer processes, and its more produced head.

No key to species is presented here because two of the species are known only from females. Characters for all of the species are illustrated.

The present interpretation of *P. alalia* (Distant) is based on a male topotype, which was compared with the female lectotype in the British Museum (Natural History). The genitalia were identical with the illustration (fig. 99) of a topotypic male in HNHM.

SPECIES OF PROCONOSAMA

[†Known only from female.]

†*aemilia* (Distant), 1908b:75 (*Aulacizes*). Bolivia. New combination.
alalia (Distant), 1908b:76 (*Aulacizes*). Bolivia. New combination.

columbica (Signoret), 1855b:236 (*Tettigonia*). Colombia, Venezuela, Ecuador, Bolivia. New combination.

integra (Melichar), 1926a:318 (*Aulacizes*). New synonymy.

eluta, new species. Colombia.

†*haenschi* (Melichar), 1926a:316 (*Aulacizes*). Peru, Bolivia. New combination.

misella (Melichar), 1926a:318 (*Aulacizes*). Peru. New combination.

Proconosama eluta, *new species*

FIGURE 100

Length of female 14 mm. (male with wing apices missing). Head with median length greater than interocular width, ocelli located slightly behind a line between anterior angles of eyes, antennal ledges with anterior margins steeply declivous. Pronotum with posterior portion of disc transversely rugose. Scutellum not transversely striate on posterior portion. Forewing with membrane not distinctly delimited from remainder of wing surface, veins elevated, corium without an anteapical plexus of veins. Pygofer rounded apically, the dorsal process slender and elongate, extending ventrally and slightly mesally in a gradual curve, acute apically; style without a distinct preapical lobe, truncate apically; aedeagus in lateral aspect with a dorsal anteapical process, in ventral aspect with shaft broad, abruptly narrowed anteapically. Female abdominal sternum VII as in *P. misella* (Melichar) (figure 103) except that posterolateral angles are more produced and rounded. Color dull red except scutellum and head which are black, the latter marked with sordid yellow; legs red.

Holotype male and one female, Colombia in USNM (C. F. Baker collection).

P. eluta, new species is closely related to *P. columbica* (Signoret) from which it differs in the shape of the aedeagus, which lacks the ventral processes of *columbica* and which is more abruptly narrowed apically.

20. *Genus* AMBLYDISCA Stål

FIGURES 105–107

Amblydisca Stål, 1869a:61. Type-species: *Tettigonia rubriventris* Signoret, by subsequent designation of Distant, 1908b:69.

Tolua Melichar, 1926a:298. Type-species: *Aulacizes multiguttata* Stål, by original designation and monotypy. New synonymy.

Length 9–11.5 mm.

Head with median length much less than interocular width, ocelli each equidistant from anterior angle of adjacent eye and median line of crown, with or without an M-shaped elevation bordering posterior margin, with or without a short weak longitudinal carina laterad of

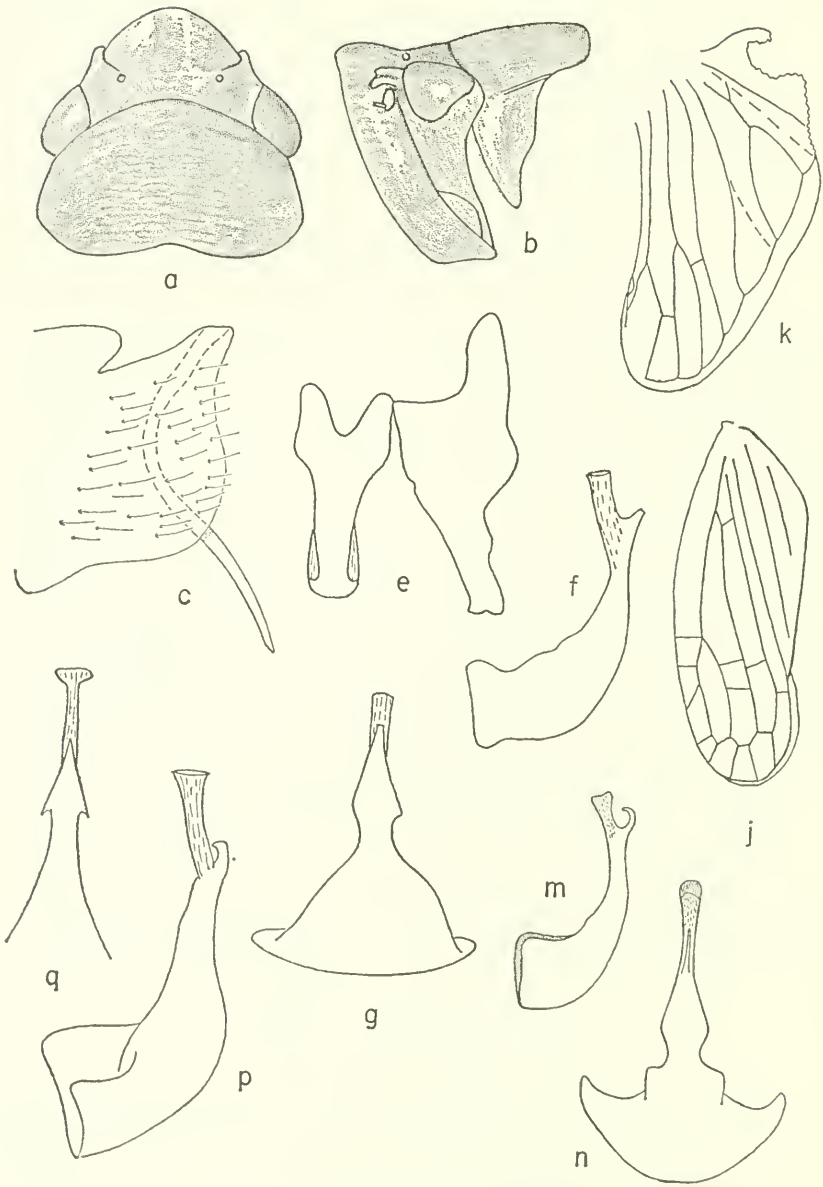
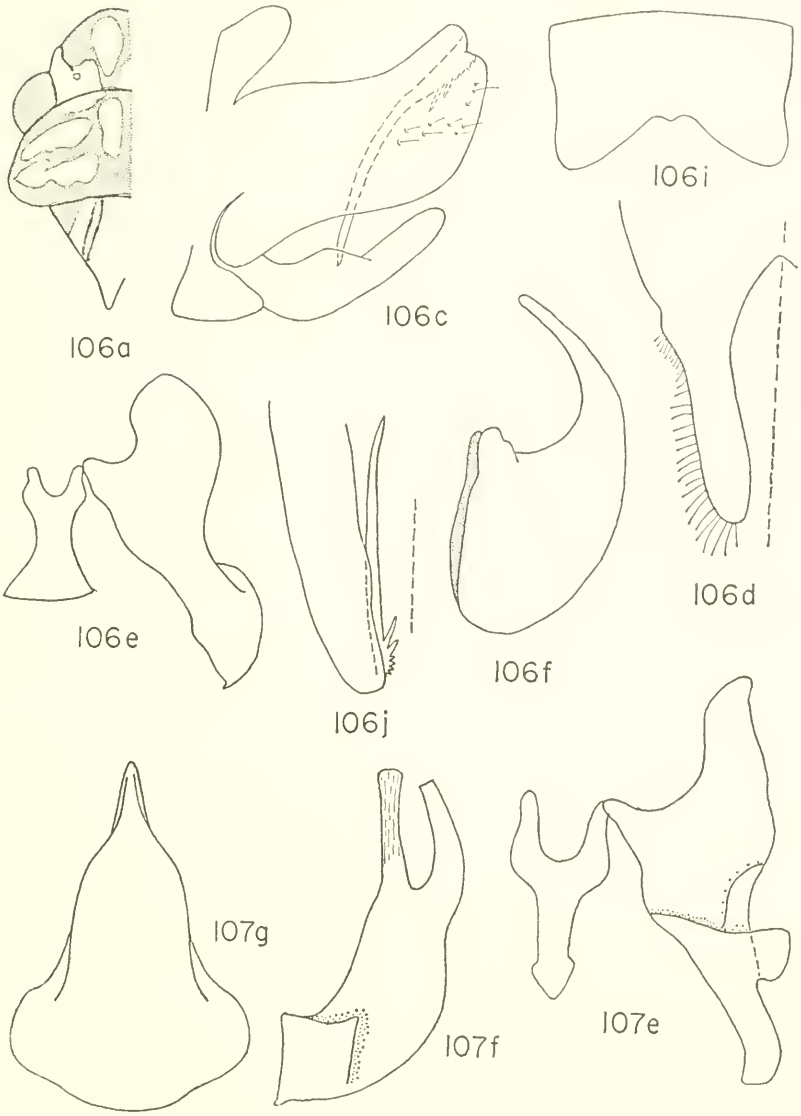


FIGURE 105.—*Amblydisca rubriventris* (Signoret) (**a-k** from specimen from Costa Rica (plate not shown in **c**); **m** and **n**, another specimen from Costa Rica; **p** and **q**, from Mexico): **j**, forewing; **k**, hindwing (jugum torn); **m** and **p**, aedeagus, lateral view; **n** and **q**, aedeagus, caudoventral view.



FIGURES 106, 107.—**106**, *Amblydisca multiguttata* (Stål) (**a** and **i** from lectotype (background dull yellow in **a**); others from lectotype of *A. tapes* (Fowler)): **j**, pygofer, left side, caudoventral view. **107**, *A. major*, new species, holotype.

each ocellus, with a shallow median fovea which is narrowed anteriorly; antennal ledges not foveate, not carinate dorsally; face sparsely pubescent below; clypellus produced, the contour of its lower half at right angle to profile of clypeus; otherwise as in *Aulacizes*.

Thorax with pronotal width greater than transocular width of head, lateral margins convergent anteriorly, posterior two-thirds of disc transversely rugose, posterior margin slightly concave; scutellum transversely rugose on posterior portion; otherwise as in *Aulacizes*. Forewing with membrane not sharply delimited, clavus very sparsely punctate, other characters as in *Aulacizes*. Hindwing and hindlegs as in *Aulacizes*.

Male genitalia: Pygofer not strongly produced posteriorly, its posterior margin usually truncate, occasionally convex, with dispersed microsetae on disc, with a slender process arising at apex of dorsal margin, extending anteroventrally or posteroventrally. Plates fused basally, tubular, their length variable interspecifically in relation to pygofer apex, with dispersed microsetae. Style extending farther posteriorly than apex of connective, with or without a preapical lobe, truncate or pointed at apex. Connective Y-shaped with arms not widely divergent. Aedeagus slender, symmetrical, with shaft usually membranous apically, usually with a ventral process arising anteapically. Paraphyses absent.

Female abdominal sternum VII, where known, with posterior margin broadly concave and with a slight median projection within the concavity.

Species of *Amblydisca* are known from Mexico, Guatemala, Costa Rica, and Nicaragua. The genus is related to *Aulacizes* but differs in its shorter pygofer processes, which arise dorsoapically, its basally fused male plates, and its shorter head bearing a median fovea that is narrowed anteriorly, as well as in other characters. The ventral aedeagal process is somewhat variable in the type-species. The form of the aedeagal shaft in caudoventral aspect is apparently a more reliable specific character, but it also exhibits some variability within species.

The present interpretation of *Amblydisca rubriventris* (Signoret) is based on a comparison of the genitalia of the male lectotype with figures 105b, c-g. The lectotype of *A. stellaris* (Walker) was found to have closely similar male genitalia.

A. tapes Fowler is placed in synonymy under *A. multiguttata* (Stål) as a result of a comparison of external characters of the male lectotype of *A. tapes* with the illustration of the female lectotype of the Stål species.

SPECIES OF AMBLYDISCA

major, new species. Mexico, Nicaragua.

multiguttata (Stål), 1864a:80 (*Aulacizes*). S. Mexico, Mexico, Guatemala. New combination.

tapes Fowler, 1898a:211. New synonymy.
rubriventris (Signoret), 1855a:52 (*Tettigonia*). Mexico, Costa Rica.
stellaris (Walker), 1858b:238 (*Aulacizes*).

KEY TO MALES OF AMBLYDISCA

1. Pygofer with posterior margin convex; aedeagus without unpaired ventral process . . . . . **A. multiguttata** (Stål) (fig. 106)
   Pygofer with posterior margin truncate; aedeagus with unpaired ventral process 2
2. Aedeagal shaft in ventral aspect with a constriction.
   A. rubriventris (Signoret) (fig. 105)
   Aedeagal shaft in ventral aspect without a constriction.
   A. major, new species

Amblydisca major, *new species*

FIGURE 107

Length of male 11.5 mm. Crown of head with weak M-shaped elevation bordering posterior margin, without a longitudinal carina laterad of each ocellus. Male pygofer truncate apically, as in *A. rubriventris* (Signoret) (fig. 105c) with a number of slender elongate microsetae on apical half of disc; plates not extending posteriorly quite as far as pygofer apex; style with distinct preapical lobe, apex curved mesad and subangulate; aedeagus with an unpaired ventral anteapical process, shaft in basal half much broader than in *A. rubriventris* (Signoret). Color of entire dorsum and face brown, forewings with a number of small, pale fenestrae.

Holotype male, Xico, Vera Cruz, Mexico, on indefinite loan to USNM from NCS. An additional male from Nicaragua and two specimens from Jalisco, Mexico, have been studied.

This species is related to *A. rubriventris*, from which it can be distinguished by its larger size, and the genital characters mentioned in the description.

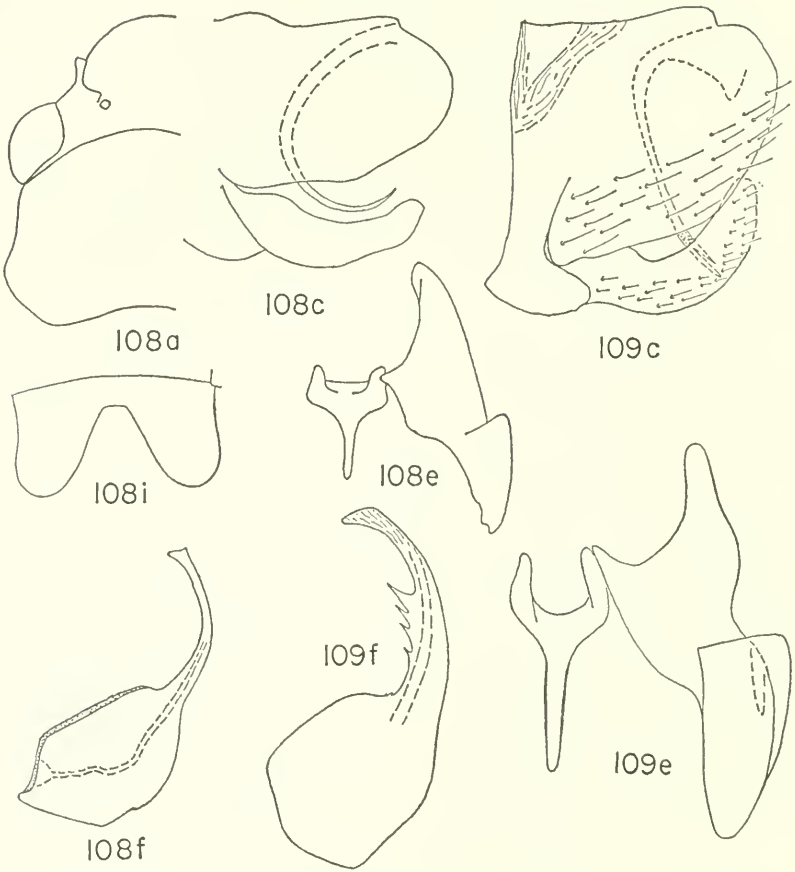
21. PROCONOPERA, *new genus*

FIGURES 108–109

Type-species: *Amblydisca pullula* Jacobi, 1905c:166.

Length 13–15 mm.

Head with median length less than interocular width, disc with pubescence; entire clypeus with broad, shallow, median depression which bears a median carina; face densely pubescent below; clypellus produced, contour of its lower half at a right angle to profile of clypeus; other characters as in *Aulacizes*.



FIGURES 108, 109.—**108,** *Proconopera pullula* (Jacobi): **a** and **i** from Bolivian specimen compared with lectotype; others from specimen from Callanga, Peru; setae not shown in **c.** **109,** *P. cumingi* (Schmidt), specimen from Colombia.

Thorax with pronotal width greater than transocular width of head, lateral margins convergent anteriorly, posterior two-thirds of pronotal disc transversely rugose, surface pubescent, dorsopleural carinae incomplete and bisinuous, other pronotal characters as in *Aulacizes;* scutellum densely pubescent in basal portion, transversely striate on posterior portion. Forewing without a distinct membrane, clavus not punctate, with one or a few anteapical crossveins to costal margin, with small setae located along margins of wing veins, other characters as in *Aulacizes.* Hindwing and hindlegs as in *Aulacizes.*

Male genitalia: Pygofer not strongly produced posteriorly, with dispersed microsetae on disc, with long slender tapering process arising

at apex of dorsal margin, curved gradually downward and posteriorly through 180°. Plates fused basally, not extending as far posteriorly as pygofer apex, triangular, with numerous dispersed microsetae. Style extending farther posteriorly than apex of connective, with distinct preapical lobe, smoothly rounded or subangulate at apex. Connective as in *Amblydisca*. Aedeagus symmetrical, with base expanded, shaft abruptly narrowed, curved gradually posteriorly and dorsally, with or without processes. Paraphyses absent.

Female abdominal sternum VII deeply and broadly emarginate medially.

Specimens belonging to this genus are at hand from Colombia, Ecuador, Peru, and Bolivia. *Proconopera* is not well represented in collections. It is very closely related to *Amblydisca*, from which it can be separated by its greater length, the fovea of the crown which is not narrowed apically as in *Amblydisca*, the sulcate antennal ledges, the pubescence on the basal portion of the pronotum, and the incomplete dorsopleural pronotal carinae.

The lectotype of *Amblydisca maculata* Schmidt is a very teneral male which was compared with *P. cumingi* (Schmidt) in external characters only.

SPECIES OF PROCONOPERA

cumingi (Schmidt), 1928a:49 (*Amblydisca*). Colombia, Ecuador, Peru. New combination.

maculata Schmidt, 1928a:50 (*Amblydisca*). New synonymy.

pullula (Jacobi), 1905c:166 (*Amblydisca*). Peru, Bolivia, Colombia. New combination.

KEY TO SPECIES OF PROCONOPERA

Pygofer process branched at apex; aedeagal shaft with dorsal teeth near midlength . . . . . **P. cumingi** (Schmidt) (fig. 109)

Pygofer process not branched at apex; aedeagal shaft without processes. **P. pullula** (Jacobi) (fig. 108)

22. *Genus* CICCIANA Metcalf

FIGURES 110, 111

Cicciana Metcalf, 1952a:228, new name for *Ciccus* Stål, 1869a:60 (not Latreille, 1829a:221). Type-species: *Ciccus latreillei* Distant, new name for *Ciccus adspersus* of authors, not Fabricius, by original designation. (see note, p. 117)

Length 15–18 mm.

Head strongly produced and not carinate at apex, median length greater than interocular width, ocelli located on a line between anterior angles of eyes, each slightly closer to median line than to adjacent

anterior eye angle, with an M-shaped elevation bordering posterior margin, median fovea complete and narrow, with an inconspicuous slight elevation laterad of each ocellus, disc of crown with microsetae; antennal ledges in lateral aspect without a longitudinal sulcus, carinate dorsally, anterior margins declivous; clypeus depressed medially, muscle impressions distinct; transclypeal suture obscure; face pubescent below; clypellus not produced, its contour continuing profile of clypeus.

Thorax with pronotal width much greater than transocular width of head, lateral margins strongly convergent anteriorly, with a transverse fovea near and parallel to anterior margin, not attaining lateral margins, disc punctate, without pubescence, posterior margin concave, with strong dorsopleural keel which is nearly rectilinear; scutellum transversely striate on posterior half. Forewing with only inner apical cell membranous, veins elevated and distinct, clavus and basal half of corium punctate, with four apical cells, the venation at their bases somewhat variable, without an anteapical plexus of veins on corium or supernumerary veins to costal margin, the wings at rest concealing apex of ovipositor in female. Hindwing extending nearly as far posteriorly as forewing, vein R_{2+3} entire. Anterior tibiae enlarged and flattened apically; hindlegs with femoral setal formula 2:1:1 or 2:1:1:1; first posterior tarsomere shorter than combined length of second and third.

Male genitalia: Pygofer well-produced, rounded apically, with a number of dispersed microsetae parallel to lower margin, with a dorsal and a ventral group of elongate, somewhat pectinate setalike processes. Plates separate throughout their length, extending as far posteriorly as pygofer apex, triangular, each with numerous dispersed microsetae. Style extending much further posteriorly than apex of connective, with distinct preapical lobe, apical portion curved laterad and sharply rounded at tip, with a few preapical, lateral microsetae. Connective linear, without distinct arms at base, slightly widened at apex, not keeled. Aedeagus symmetrical, shaft short and without apical processes, with a pair of processes arising at base, extending posteriorly, then curved anteriorly, each with an anteapical projection. Paraphyses absent.

Female abdominal sternum VII with posterior margin trilobate.

Cicciana is known from Surinam, and eastern and southern Brazil. It is believed to be related to *Peltocheirus* and *Acrocampsa*, from both of which it can be separated by its most peculiar pygofer processes and by the presence of basiventral aedeagal processes which are not present in either of the other genera.

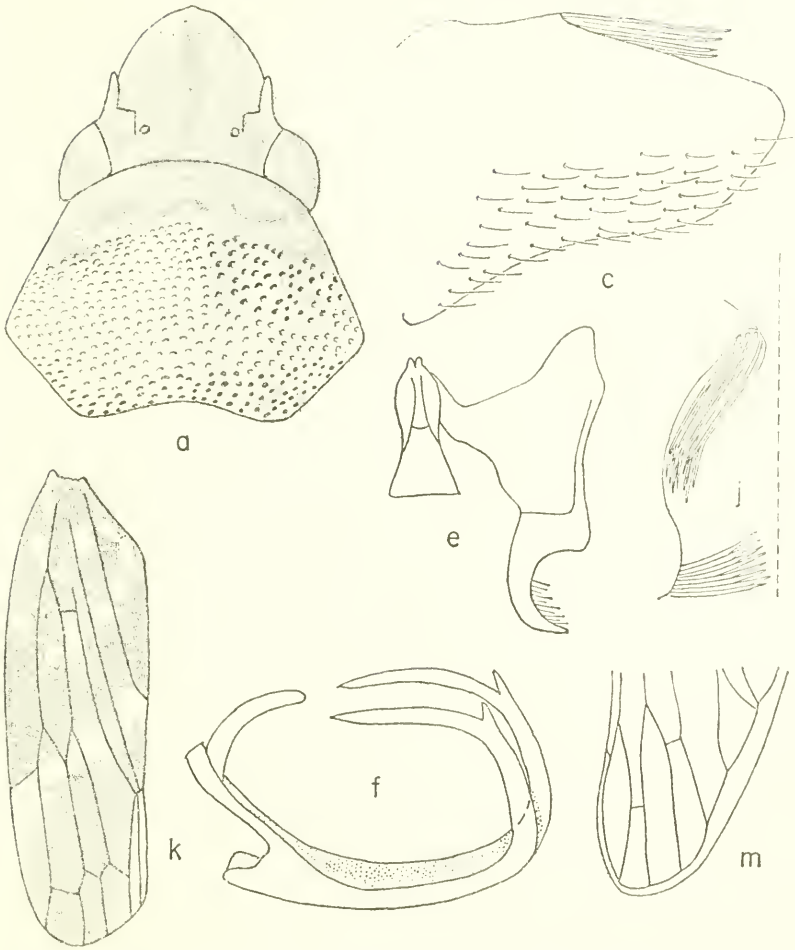


FIGURE 110.—*Cicciana latreillei* (Distant), specimen from southeastern Brazil (plate not shown in **c**): **j**, pygofer, left side, posterior view; **k**, forewing; **m**, hindwing.

SPECIES OF CICCIANA

latreillei * (Distant), 1908b:81 (*Ciccus*), new name for *Ciccus adspersa* Burmeister, not Fabricius. SE. Brazil.

obliqua (Walker), 1851b:800 (*Ciccus*). D. Guiana, E. and SE. Brazil.

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*I follow Metcalf in this case of a misidentified type species. Metcalf, however, did not completely solve the problem, for his action left *Ciccus latreillei* Distant without a type. I select here the illustration of Blanchard (1840a, pl. 14, fig. 6) as the type of *C. latreillei* Distant.

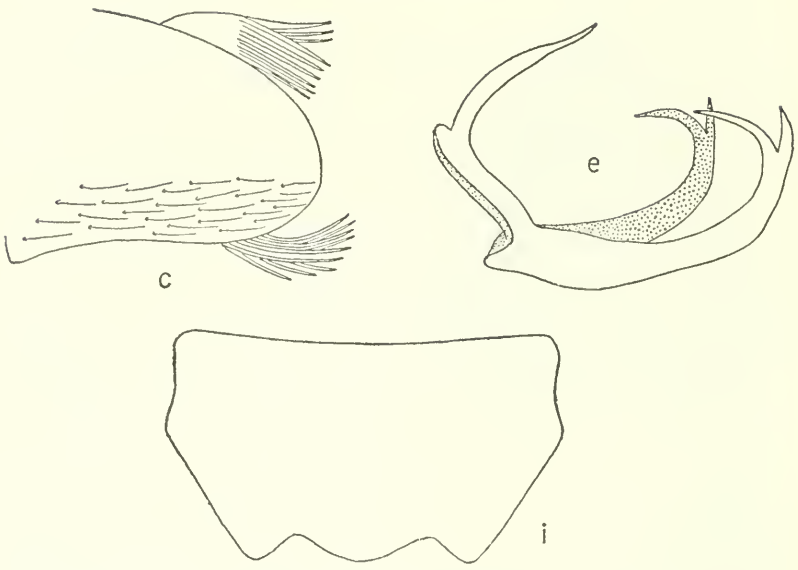


FIGURE 111.—*Cicciana obliqua* (Walker), specimens from Santa Catarina, Brazil, plate not shown in c.

KEY TO SPECIES OF CICCIANA

Specimens in dorsal aspect black, with undulate posterior band on pronotum and oblique band on apical half of forewing, yellow. C. obliqua (Walker) (fig. 111)

Specimens in dorsal aspect brown, with yellow markings much more numerous. . . . . C. latreillei (Distant) (fig. 110)

23. Genus PELTOCHEIRUS Walker

FIGURES 112, 113

Peltocheirus Walker, 1858b:247. Type-species: *Tettigonia bigibbosa* Signoret, by monotypy.

Cymbalopus Kirkaldy, 1907d:88. Type-species: *Tettigonia bigibbosa* Signoret, by original designation and monotypy.

Length 13–15 mm.

Head well produced, with anterior margin broadly rounded or weakly carinate at apex, median length less than interocular width, ocelli prominent, with a distinct M-shaped elevation bordering posterior margin, with a median full-length fovea and a tuberosity on each side of it at apex, without a longitudinal keel laterad of each ocellus, disc with or without microsetae; antennal ledges longitudinally foveate, in lateral aspect with dorsal margin carinate and with anterior

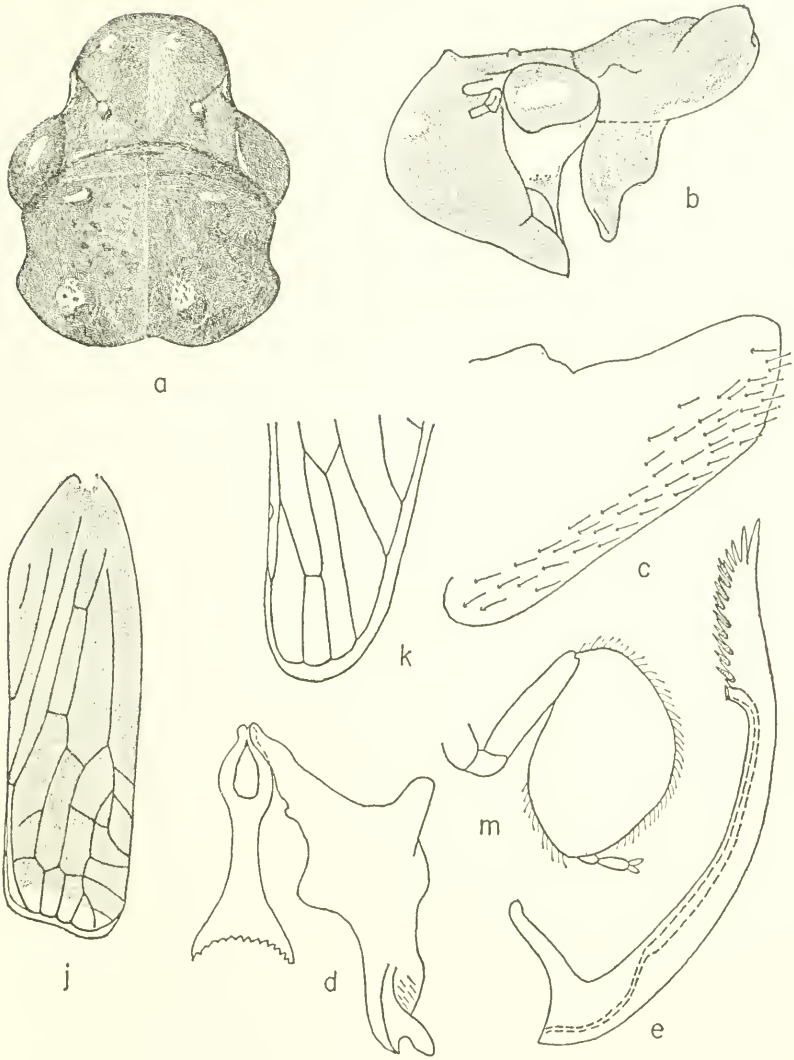


FIGURE 112.—*Peltocheirus paradoxus* Melichar, specimen from Venezuela, except **m**, which is from lectotype (plate not shown in **c**): **j**, forewing; **k**, hindwing.

edge steeply declivous; clypeus strongly convex in profile, with disc flattened or depressed dorsally in anterior aspect, muscle impressions conspicuous, transclypeal suture entire or not; face pubescent; clypellus not produced, without a median carina.

Thorax with pronotal width equal to or exceeding transocular width of head, lateral margins undulate, with a transverse anterior submarginal fovea behind which disc is gradually elevated posteriorly and with a median more anterior, and two more posterior tuberosities, disc coarsely punctate to pitted, posterior margin concave, with a dorsopleural keel which varies from oblique and rectilinear to strongly arched; scutellum transversely striate (striae often indistinct) in posterior half. Forewing with a very narrow membrane including inner apical cell and apical portions of other apical cells, remainder of wing usually heavily coriaceous and with venation obscure; second, third, and fourth apical cells of approximately equal length; without

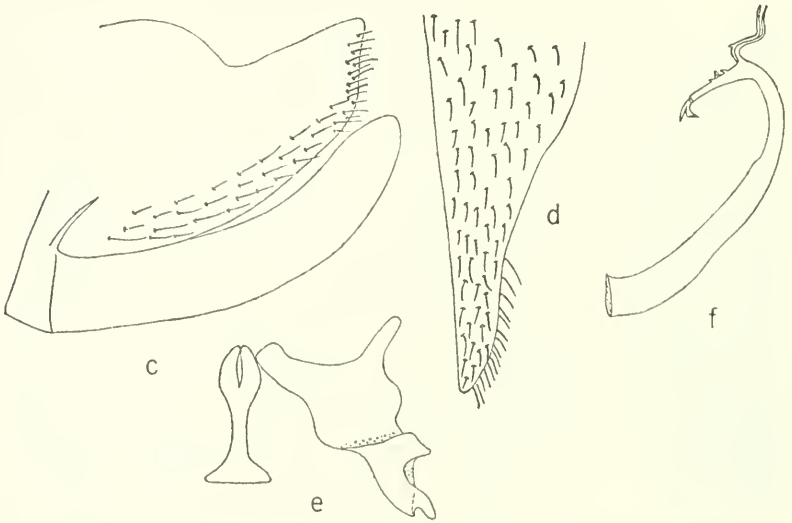


FIGURE 113.—*Peltocheirus bigibbosus* (Signoret), specimen from Surinam.

an anteapical plexus of veins but with supernumerary veins to costal margin in apical third of wing; apical margin shallowly concave; wings of female in rest position concealing ovipositor. Hindwing at rest extending almost as far posteriorly as apex of forewing; vein R_{2+3} entire. Anterior legs with tibiae conspicuously flattened and expanded. Hindlegs with femoral setal formula 2:0:0; first tarsomere with length less than combined length of second and third.

Male genitalia: Pygofer strongly produced and diagonally truncate apically, with numerous submarginal microsetae near apical and posteroventral margins, without processes. Plates separate throughout length, extending farther posteriorly than pygofer apex, each triangular, with numerous uniformly dispersed microsetae. Style extending farther

posteriorly than connective, with a distinct preapical lateral and a more posterior preapical mesal lobe, rounded apically. Connective Y-shaped, with arms approximate, stem broadened apically, not keeled medially. Aedeagus symmetrical, slender, elongate, with a number of small apical processes. Paraphyses absent.

Female abdominal sternum VII with posterior margin transverse with or without posterolateral lobes which are produced posteriorly.

Peltocheirus is known from Venezuela, French and Dutch Guiana, the Amazon Valley in Brazil, and from an Amazon tributary in Peru. It is related to *Cicciana*, in the treatment of which (p. 115) distinguishing characters are discussed, and very closely related to *Acrocampsa* from which it can be separated by the characters set forth in the key. Specimens are very rare in collections.

The present interpretation of *P. bigibbosus* (Signoret) is based on a male specimen from Surinam in NMV. Signoret stated that the type locality was Cayenne. The male was dissected and the genitalia found to be like those illustrated in figure 113. The interpretation of *P. paradoxus* Melichar is based on a comparison of the female lectotype with the external characters illustrated in figure 112.

SPECIES OF PELTOCHEIRUS

[*Type not seen.]

**bigibbosus* (Signoret), 1855c:510 (*Tettigonia*). D. Guiana, Fr. Guiana.
paradoxus Melichar, 1926a:332. Venezuela, N. Brazil.
peruvianus, new species. Peru.

KEY TO SPECIES OF PELTOCHEIRUS

1. Middle legs with a number of long, fine tibial microsetae 2
   Middle tibiae without such setae. . . . P. peruvianus, new species
2. Aedeagus with uniform pinnate projections at apex.
   P. paradoxus Melichar (fig. 112)
   Aedeagus with fewer projections, with a process extending anteriorly and a pair of processes extending posteriorly at apex.
   P. bigibbosus (Signoret) (fig. 113)

Peltocheirus peruvianus, *new species*

Length of female 13.4 mm. Crown of head with numerous microsetae, anterior margin strongly keeled at border with face. Pronotum with elevations much more pronounced than in *P. paradoxus* Melichar. Anterior legs with tibiae not nearly as much expanded as in *P. bigibbosus* (Signoret) and *P. paradoxus* Melichar, middle femora not strongly pubescent as in *bigibbosus* (Signoret) and *paradoxus* Melichar.

260-649—68——9

The species is closely related to both of the other species here included in the genus. It differs in the characters mentioned above.

Holotype female with labels "Rio Ucuyali,/Peru XII–6–26/F 6039" and "H. Bassler/Collection/Acc. 33591" (AMNH).

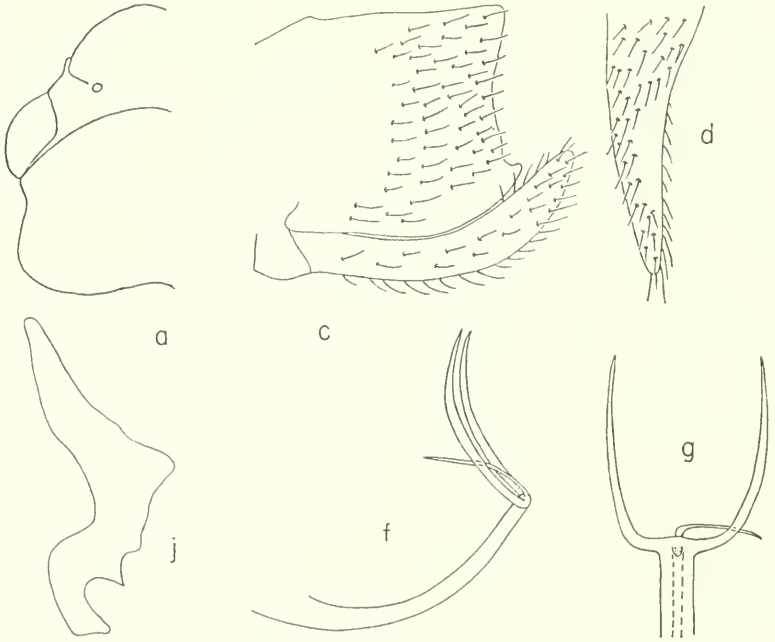


FIGURE 114.—*Yotala boliviana* Melichar, lectotype (somewhat teneral): j, right style, dorsal view.

24. *Genus* YOTALA Melichar

FIGURE 114

Yotala Melichar, 1925a:336. Type-species: *Y. boliviana* Melichar (1925a:337), by original designation and monotypy.

Length of male 11.5 mm.; of female 13 mm.

Head moderately produced, with median length less than interocular width, anterior margin rounded in dorsal aspect, with a distinct carina between crown and face, without a pronounced tuberosity on each side of median fovea, surface of crown thickly pubescent; clypeus with disc depressed dorsally in anterior aspect; transclypeal suture entire; other head characters as in *Peltocheirus*.

Thorax with pronotal width equal to transocular width of head, surface contour elevated as in *Peltocheirus* but less strongly so, disc

coarsely pitted, with dorsopleural carina which is strongly arched; other characters as in *Peltocheirus*. Wings and legs as in *Peltocheirus*.

Male genitalia: Pygofer moderately produced and truncate apically, the posterior margin concave, with numerous dispersed microsetae on posterior half of disc, without processes. Plates separate throughout their length, extending farther posteriorly than pygofer apex, each narrowly triangular, with numerous dispersed microsetae. Style not extending as far posteriorly as apex of connective, without an anteapical lobe, truncate apically. Aedeagus asymmetrical, slender, elongate, with an apical median asymmetrical process and a pair of symmetrical apical processes. Paraphyses absent.

Female abdominal sternum VII with a broad submembranous apical marginal area, the posterior margin convex and produced.

Totala is known only from the type-species, which occurs only in Bolivia and in Mato Grosso, Brazil. It is very closely related to *Peltocheirus*, from which it may be distinguished most readily by its moderately produced pygofer with the posterior margin concave, by its truncate style apices, and by its asymmetrical median aedeagal process.

25. *Genus* ACROCAMPSA Stål

FIGURES 115–120

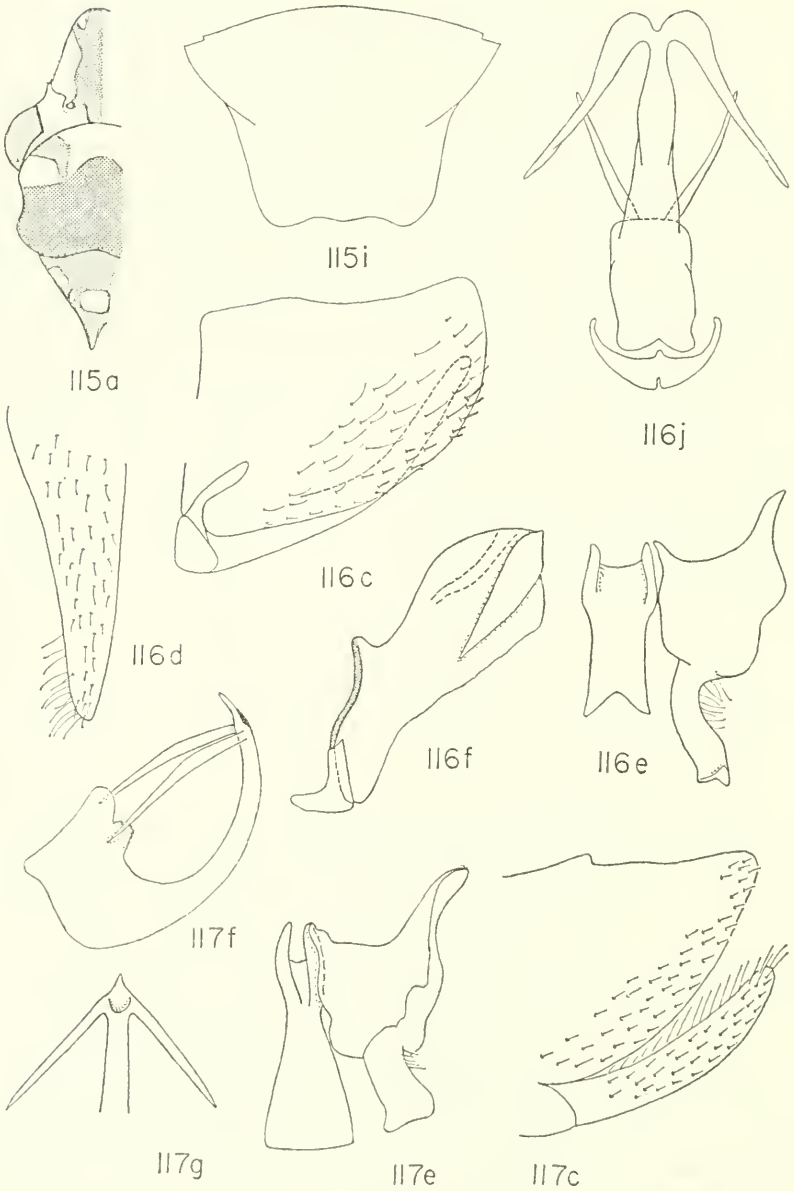
Acrocampsa Stål, 1869a:66. Type-species: *Fulgora pallipes* Fabricius, by monotypy.

Length 11–14 mm.

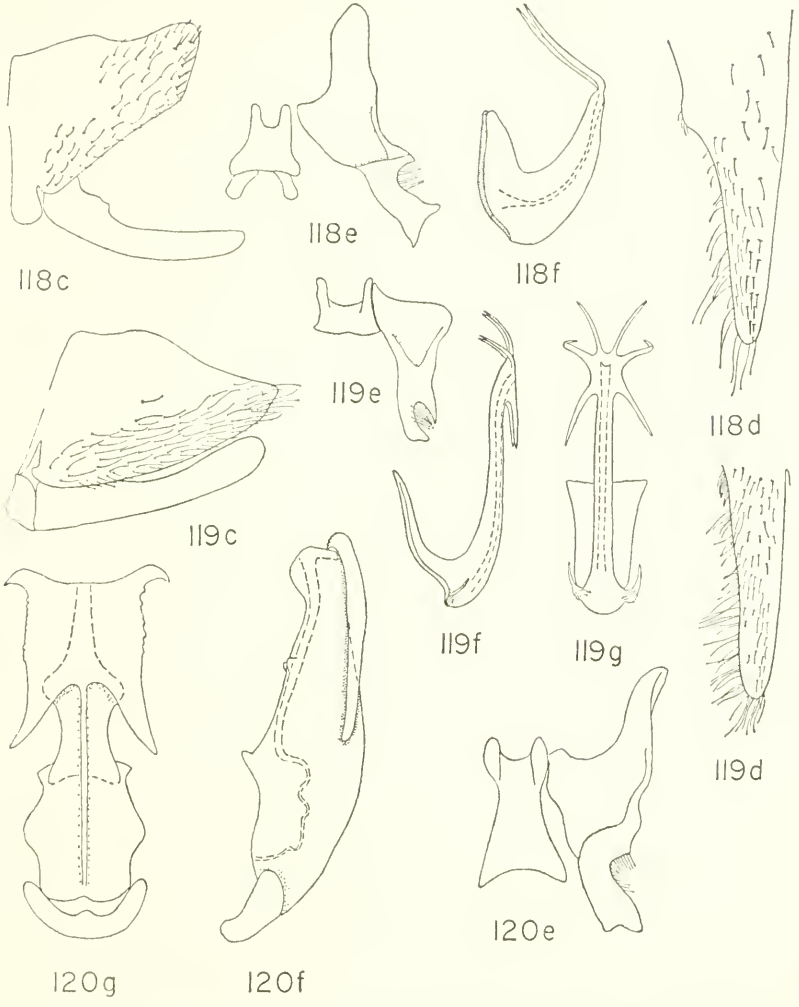
Head strongly produced, lateral margins concave in dorsal aspect, median length greater than interocular width, less than transocular width, anterior margin curved dorsally and carinate at apex, ocelli located on or slightly behind a line between anterior angles of eyes, each slightly closer to midline than to adjacent eye angle, surface with fine pubescence; clypeus depressed medially, muscle impressions distinct, transclypeal suture obsolete; other characters as in *Peltocheirus*.

Thorax with pronotum not wider than head, lateral margins slightly concave, posterior two-thirds of disc convexly elevated and with surface punctate and occasionally rugose, with or without pubescence, with complete dorsopleural carinae, each carina curved slightly downward at midlength; scutellum with or without striae on posterior portion; otherwise, as in *Peltocheirus*. Forewing with veins distinct or not, occasionally elevated, clavus and corium coriaceous, punctate, with four apical cells, the base of the fourth not more basal than base of third; otherwise as in *Peltocheirus*. Hindwing and legs as in *Peltocheirus*.

Male genitalia: Pygofer with ventral margins overlapping plates, moderately produced, posterior margin rounded, with numerous dis-



FIGURES 115–117.—**115,** *Acrocampsa rutilans* (Fabricius), lectotype, lightly shaded area castaneous, heavily shaded, green. **116,** *A. pallipes* (Fabricius), specimen from Maroni River, French Guiana (paraphyses shown in **f**): **j,** aedeagus, paraphyses, and tendons, posteroventral view. **117,** *A. integra* Melichar, specimen from Trinidad.



FIGURES 118–120.—**118,** *Acrocampsa diminuta* (Walker), specimen from "Monat," Brazil, vestigial paraphyses shown in **e.** **119,** *A. radiata*, new species, holotype. **120,** *A. bakeri*, new species, holotype, paraphyses shown in **f** and **g.**

persed microsetae posteriorly and posteroventrally and occasionally with a few interspersed macrosetae, without processes. Plates separate throughout their length, extending as far posteriorly as pygofer apex, triangular, with numerous dispersed microsetae and occasionally with few interspersed macrosetae. Style extending as far as or farther posteriorly than apex of connective, with a distinct preapical lobe,

apex truncate and slightly concave, with a few setae arranged serially behind preapical lobe. Connective U- or Y-shaped, not keeled medially. Aedeagus symmetrical, with at least a pair of apical processes, and occasionally with processes at base or near middle. Paraphyses present or absent, when present reduced and occurring as a single transverse sclerite at base of aedeagal shaft.

Female abdominal sternum VII truncate and with posterior margin slightly undulate.

This genus appears to be restricted to a region near the Atlantic coast of South America. All but one of the specimens studied were from the region from Trinidad and Venezuela to Rio de Janeiro. The one (possible) exception is labeled "Amazonas." *Acrocampsa* is very closely related to *Peltocheirus*, from which it can be distinguished by the characters set forth in the key.

The lectotype of *A. maculata* (Walker) agrees well with the illustration (fig. 115) of the female lectotype of *A. rutilans* (Fabricius); the latter species, however, is probably the same as *A. pallipes* (Fabricius). The male lectotypes of *A. pallipes* (Fabricius) and of *A. rufa* Melichar have genitalia like figure 116. The male lectotype of *A. integra* Melichar has genitalia like figure 117. The male holotype of *A. diminuta* (Walker) is like figure 118, except that its style apices are slightly broader and slightly more concave.

SPECIES OF ACROCAMPSA

[†Known only from female type.]

bakeri, new species. Brazil.
diminuta (Walker), 1851b:801 (*Ciccus*). Brazil, SE. Brazil.
integra Melichar, 1925a:339. Venezuela, Trinidad Is.
pallipes (Fabricius), 1787a:261 (*Fulgora*). Trinidad Is., Venezuela, Fr. Guiana.
    rufa Melichar, 1925a:339. New synonymy.
radiata, new species. Brazil.
rutilans (Fabricius), 1803a:64 (*Cicada*). Brazil.
    †*maculatus* (Walker), 1851b:801 (*Ciccus*).

KEY TO MALES OF ACROCAMPSA

Not included: *rutilans* (Fabricius) (fig. 115), known only from female.

1. Aedeagus with a broad apical quadrate flange in caudoventral aspect, with each of the corners of the flange produced into a process . . . . . A. bakeri, new species
   Aedeagus not so 2
2. Aedeagal apex with six radiating processes.
   A. radiata, new species
   Aedeagus with only two apical processes. 3

3. Aedeagus with apical processes extending dorsally.
A. diminuta (Walker) (fig. 118)
Aedeagus with processes directed towards base of shaft. 4
4. Aedeagal shaft quite broad in lateral aspect, the apical processes not attaining base of shaft. . . . A. pallipes (Fabricius) (fig. 116)
Aedeagal shaft narrow in lateral aspect, the apical processes attaining base of shaft. . . . . A. integra Melichar (fig. 117)

Acrocampsa bakeri, *new species*

FIGURE 120

Length of male 11–12 mm.; of female 13 mm. Pronotum without pubescence. Scutellum finely transversely striate on posterior portion. Forewings with veins not very distinct. Male pygofer with only a few, sparse microsetae; style extending farther posteriorly than apex of connective; connective Y-shaped with stem gradually broadened posteriorly; aedeagus with a pair of short, dorsal, rounded processes near midlength, with a ventral, apical flange which is quadrate in posteroventral aspect and with a process from each corner; paraphyses reduced to a short, transverse, crescentiform sclerite. Ground color of crown, pronotum, scutellum, and in some specimens anterior portion of forewings dull yellow to dull greenish yellow, an irregular broad median stripe on crown, a pair of markings on pronotum one behind each inner eye margin, and a few markings at forewing base, black; apical two-thirds of forewing black; face black, margined with dull yellow above.

Holotype male and a topotypic female, Santarém, Brazil, and another male, Rio de Janeiro, all from collection of C. F. Baker (USNM).

This species differs from all other species of *Acrocampsa* in the flangelike apicoventral process. It is named in honor of the eminent homopterist, C. F. Baker, whose excellent collection has added significantly to our knowledge of the world cicadellid fauna.

Acrocampsa radiata, *new species*

FIGURE 119

Length of male 11 mm. Posterior two-thirds of pronotal disc punctate; scutellum without transverse striae on posterior portion of disc. Forewings with veins not distinct, not elevated. Male pygofer and plates with numerous fine, elongate microsetae; style extending much farther posteriorly than apex of connective; connective broadly U-shaped; aedeagus with a pair of inconspicuous short ventral basal processes, and with three pairs of apical processes which appear to radiate from aedeagal apex in caudoventral aspect, in lateral aspect with two pairs of processes directed dorsally; one pair directed ventrally; paraphyses

absent. Ground color of crown, pronotum and scutellum yellow, with an irregular median coronal marking, several dark submarginal markings on pronotum near anterior margin, transverse sulcus and a lateral extension on each side of scutellum, black; forewings maroon (specimen somewhat teneral); face as in *A. bakeri*, new species.

This species differs from all other species of *Acrocampsa* in having three pairs of apical aedeagal processes and in having paired basal aedeagal processes.

Holotype male, Pernambuco, Brazil, P. R. Uhler collection (USNM).

26. PARACROCAMPSA, *new genus*

FIGURES 121–124

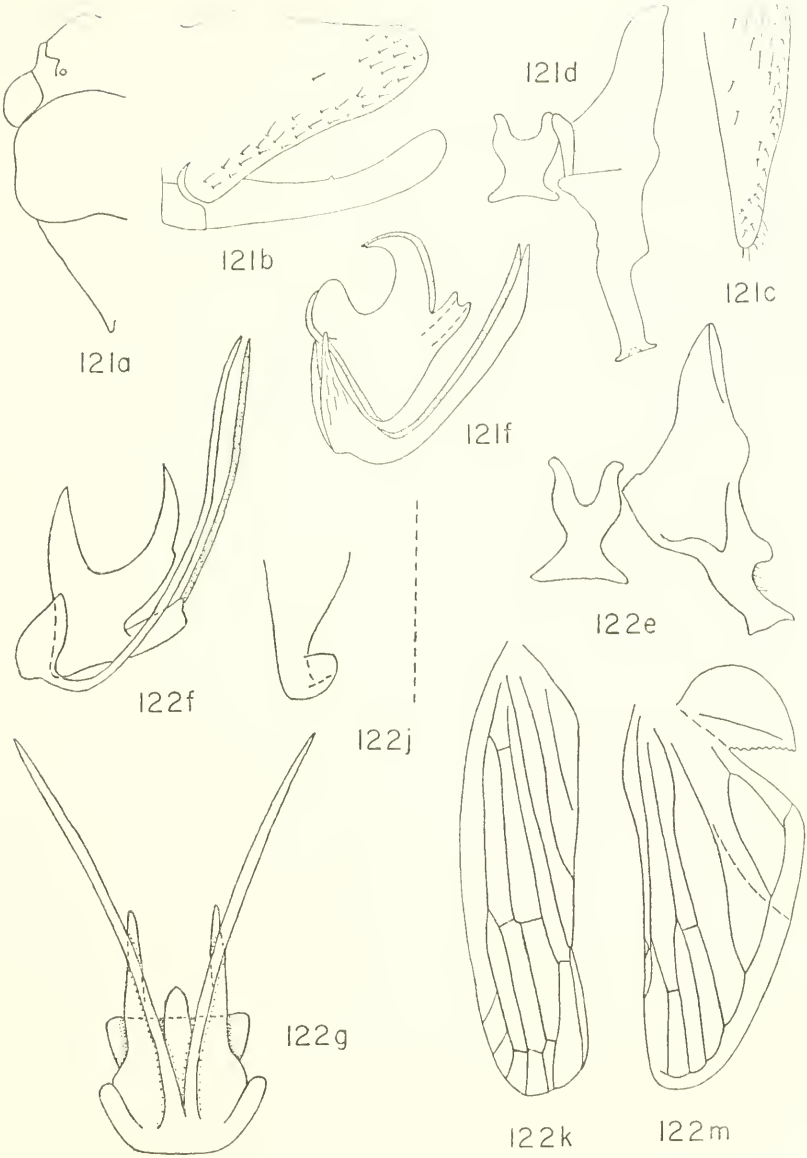
Type-species: *Amblydisca amida* Distant.

Length 11–13.5 mm.

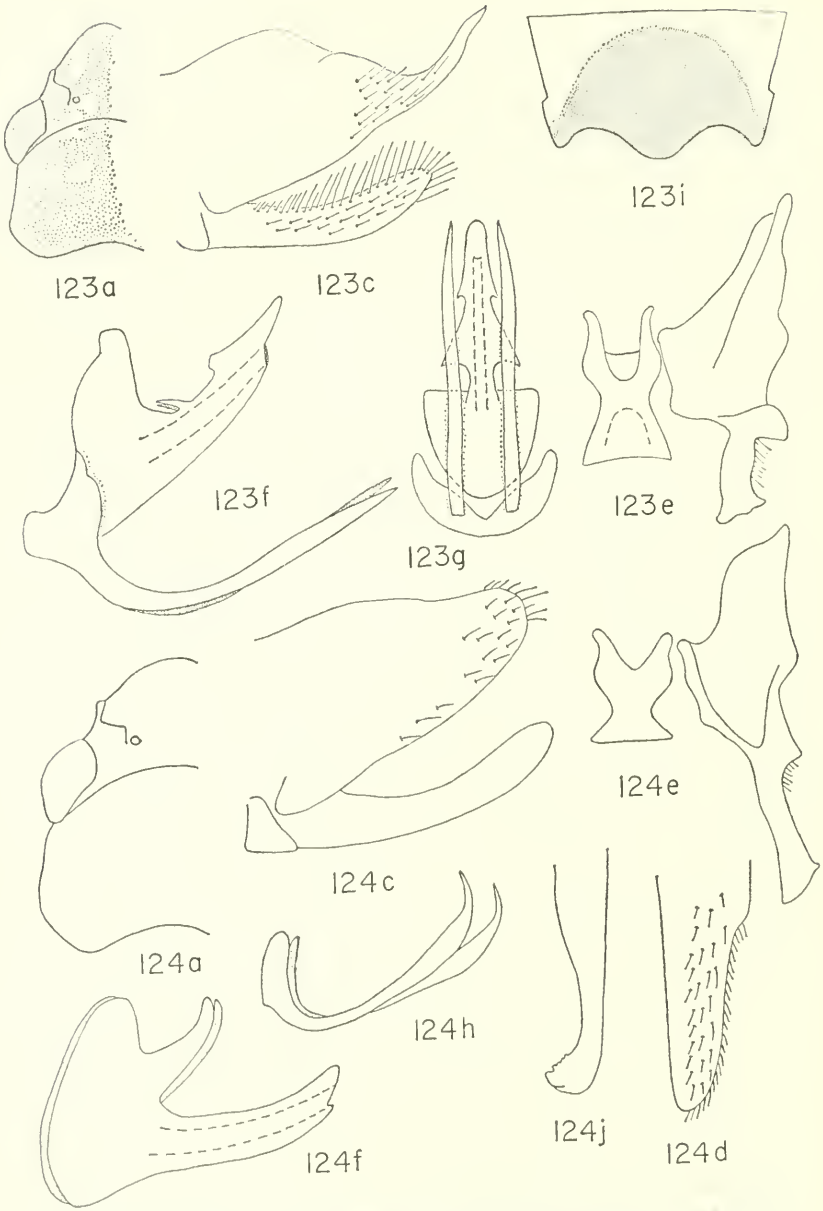
Head moderately produced, median length less than interocular width, anterior margin elevated and carinate, ocelli located on a line between anterior angles of eyes, each about equidistant between adjacent eye angle and median line, usually with an M-shaped elevation bordering posterior margin, with a shallow median fovea which is broadened apically, without a longitudinal carina laterad of each ocellus, surface of crown with fine pubescence; antennal ledges with or without a longitudinal fovea, carinate dorsally or not in lateral aspect, anterior margins steeply declivous; clypeus depressed medially, muscle impressions distinct; face finely pubescent below; clypellus subangulate in lateral aspect, its lower portion almost at right angle to profile of clypeus, not laterally compressed.

Thorax with pronotal width equal to or slightly greater than transocular width of head, lateral margins usually parallel, with posterior portion of disc rugose or rugose and punctate, posterior margin concave, usually with dorsopleural carinae complete and curved ventrally at midlength; scutellum transversely striate on posterior portion. Forewings usually with a membrane which includes all of apical cells, veins usually distinct and slightly elevated, clavus and corium coriaceous, the clavus usually and adjoining brachial cell occasionally punctate, with four apical cells, the relative positions of bases of third and fourth apical cells variable, without an anteapical discal plexus of veins on corium, with or without anteapical supernumerary veins to costal margin, wings of female at rest concealing ovipositor. Hindwing extending almost as far posteriorly as forewing; vein R_{2+3} incomplete. Hindlegs with femoral setal formula 2:1:0, or rarely 2:1:1; first tarsomere with length less than combined length of second and third.

Male genitalia: Pygofer moderately produced and rounded or with an apical process, with a few dispersed microsetae located along postero-



FIGURES 121, 122.—**121,** *Paracrocampsa amida* (Distant), lectotype, paraphyses shown in **f.** **122,** *P. discreta* (Melichar), specimen from Guayaquil, Ecuador; paraphyses shown in **f** and **g**: **j,** apex of left side of pygofer, dorsal view; **k,** forewing; **m,** hindwing.



FIGURES 123, 124.—**123**, *P. laboulbeni* (Signoret): **a** and **i** from holotype of *P. luridescens* (Walker), others from specimen from Colombia, paraphyses shown in **f** and **g**. **124**, *P. nativa* (Melichar), lectotype (**h**, in lateral view): **j**, pygofer apex, right side, dorsal view.

ventral margin and apically, or only anteapically. Plates separate throughout their length, not extending farther posteriorly than pygofer apex, triangular, with numerous dispersed microsetae. Style extending much farther posteriorly than apex of connective, with a distinct preapical lobe, truncate or obliquely subtruncate at apex, with a few serially-arranged microsetae behind preapical lobe. Connective short, Y-shaped, arms not widely divergent, stem broadened apically, not keeled medially. Aedeagus symmetrical with a conspicuous dorsal process or pair of processes. Paraphyses elongate, slender.

Female abdominal sternum VII with a median, or a median and two lateral slightly produced rounded lobes on posterior margin.

Specimens belonging to this genus have been examined from Nicaragua, Colombia, Ecuador, and Venezuela. *Paracrocampsa* appears to be related to *Acrocampsa* in the form of the genital capsule, the styles, and the connective. It differs in the form of the aedeagus, the shorter head, which is not curved dorsally at its apex nearly as much as in *Acrocampsa*, and in the incomplete vein R_{2+3} of the hindwing, which is complete in *Acrocampsa*.

P. nativa (Melichar) is included here only provisionally, for it differs in a number of respects from the other included species.

A male specimen in ZIMH is here designated lectotype of *Amblydisca discreta* Melichar. It bears labels "Ecuador/Guayaquil/F. Ohs. 11.05" and "Dr. F. Ohaus/vend. 20.VII. 1911" and "Amblydisca/discreta M./L. Melichar det. 1922" and a hand-written identification label. A similarly labeled specimen is in MMB. The male genitalia of this specimen are like those of figure 122, except that the dorsal process of the aedeagus does not have the irregularity on its ventral margin as does the specimen illustrated. Another specimen from Ecuador has shorter paraphyses, indicating that this character, also, is variable.

The genitalia of the male lectotype of *P. laboulbeni* (Signoret) are like those of figure 123. *P. luridescens* (Walker) is placed in synonymy on the basis of dissections of males which agree with the female holotype. The lectotype of *P. nativa* (Melichar) was parasitized, but the male genitalia are apparently normal.

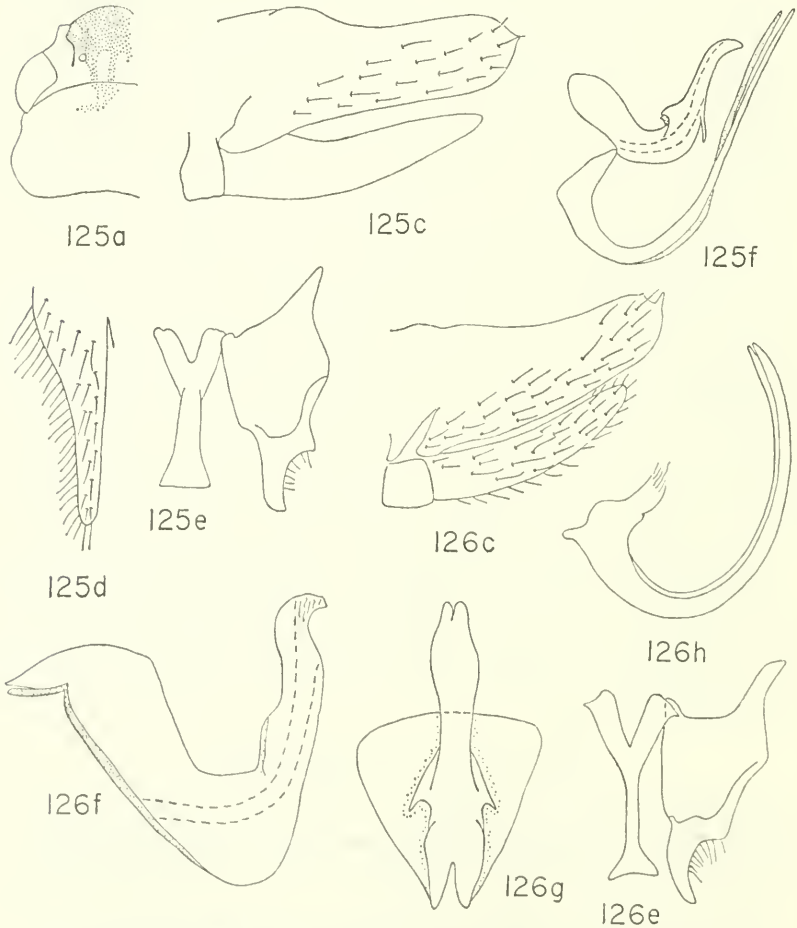
SPECIES OF PARACROCAMPSA

amida (Distant), 1908b:70 (*Amblydisca*). Ecuador. New combination.
aulaeata (Fowler), 1898a:212 (*Amblydisca*). Nicaragua. New combination.
discreta (Melichar), 1926a:296 (*Amblydisca*). Ecuador. New combination.
laboulbeni (Signoret), 1855a:52 (*Tettigonia*). Colombia, Venezuela. New combination.
luridescens (Walker), 1858b:240 (*Aulacizes*). New synonymy.
nativa (Melichar), 1926a:294 (*Amblydisca*). Ecuador. New combination.

KEY TO MALES OF PARACROCAMPSA

Not included: *aulaeata* (Fowler), known only from females.

1. Aedeagus with a median unpaired dorsal process.
   P. discreta (Melichar) (fig. 122)
   Aedeagus with paired dorsal processes. 2
2. Style obliquely subtruncate at apex. P. nativa (Melichar) (fig. 124)
   Style more nearly transversely truncate at apex. 3
3. Pygofer gradually narrowed apically and produced into an elongate process. . . . . P. laboulbeni (Signoret) (fig. 123)
   Pygofer rounded apically. . . . . P. amida (Distant) (fig. 121)



FIGURES 125, 126.—125, *Anacrocampsa frenata* (Melichar), lectotype, paraphyses shown in f. 126, *A. wagneri*, new species, holotype, h from lateral view.

27. ANACROCAMPSA, *new genus*

FIGURES 125, 126

Type-species: *Amblydisca frenata* Melichar.

Length of male 10.8–11.5 mm.

Head moderately produced, with median length slightly more than half interocular width, ocelli each closer to median line than to adjacent anterior eye angle, without an M-shaped elevation bordering posterior margin, surface of crown with or without pubescence; antennal ledges each with a longitudinal fovea, carinate dorsally in lateral aspect; other head characters as in *Paracrocampsa*.

Thorax with lateral pronotal margins convergent anteriorly, pronotal disc coarsely punctate, in lateral aspect with a complete dorsopleural keel which is arched downwards; other thoracic characters as in *Paracrocampsa*. Forewing with a membrane which includes all apical cells, veins indistinct, clavus and corium coriaceous, the former punctate, otherwise as in *Paracrocampsa*. Hindwing as in *Paracrocampsa*. Hindlegs with femoral setal formula 2:0:0; or 2:1:0; otherwise as in *Paracrocampsa*.

Male genitalia: Pygofer strongly produced and with a slight apical unsclerotized process, with a few elongate microsetae on disc (except dorsally) from base to apex. Plates separate throughout their length, not extending as far posteriorly as pygofer apex, each triangular, with numerous evenly dispersed microsetae. Style extending very slightly farther posteriorly than apex of connective, with a distinct preapical lobe, rounded or subangulate at apex. Connective Y-shaped, with stem much longer than arms and widened apically, not keeled. Aedeagus symmetrical, with paired dorsal processes, with or without a ventral process on shaft. Paraphyses elongate, slender, curved regularly posterodorsally.

Female abdominal sternum VII strongly, regularly convex in *A. bidens* (Taschenberg).

Specimens have been examined only from southeastern Brazil. *Anacrocampsa* is very closely related to *Paracrocampsa*, from which it may be readily distinguished by its more rounded head apex in dorsal aspect, its more elongate connective and the form of the style apices which are not truncate as they are in *Paracrocampsa*.

A lectotype label was placed by me on the female specimen from the type series of *Tettigonia bidens* Taschenberg, loaned from HS. The specimen bore no labels, but the accompanying label was "bidens m/ Bras. [one word illegible]." The abdomen is missing from the other specimen.

SPECIES OF ANACROCAMPSA

bidens (Taschenberg), 1884a:454 (*Tettigonia*). SE Brazil. New combination.
frenata (Melichar), 1926a:295 (*Amblydisca*). New combination.
wagneri, new species. Brazil.

KEY TO SPECIES OF ANACROCAMPSA

1. Forewings with a longitudinal conspicuous yellow stripe from base almost to apex, interrupted only anteapically.
A. bidens (Taschenberg)
Forewings not so marked 2
2. Aedeagus in lateral aspect with an unpaired ventral process.
A. frenata (Melichar) (fig. 125)
Aedeagus in lateral aspect without a ventral process.
A. wagneri, new species

Anacrocampsa wagneri, *new species*

FIGURE 126

Length of male 10.8 mm. Head without pubescence on surface of crown. Forewings with veins not distinct. Hindlegs with femoral setal formula 2:0:0. Aedeagus without an unpaired median ventral process. Other structural characters as in generic description. Color of crown yellow, scarcely (type) or rather heavily marked with black medially, the dark area enclosing two oval yellow spots on basal half; pronotum greenish yellow with dark punctures on disc and dark areas along anterior margin delimiting several yellow spots; scutellum castaneous with two conspicuous median yellow spots; forewings brown sprinkled with small greenish yellow spots, with a larger yellow spot before base of inner apical cell; face yellow, except a broad median area of clypeus, which is extended more narrowly onto clypellus as far as angle of latter; thoracic venter and pleura yellow; legs castaneous.

Holotype male, New Freiburg, South Brazil (F. Wiengren), labeled as a cotype of *Amblydisca frenata* Melichar (ZIMH), and one additional male, labeled paralectotype of *Amblydisca frenata* (MMB).

This species is very closely related to *Anacrocampsa frenata* (Melichar), from which it may be distinguished by characters mentioned in the above description and key. The species is named in honor of Dr. Wilhelm Wagner, of the Zoologisches Museum in Hamburg, who has made notable contributions to homopterous taxonomy and whose help and warm hospitality to the author and his wife made work in Hamburg a pleasant task.

28. Genus ICHTHYOBELUS Melichar

FIGURES 127–130

Ichthyobelus Melichar, 1925a:360. Type-species: *I. bellicosus* Melichar, by original designation and monotypy.

Length 12–14 mm.

Head strongly produced, the apex extended anteriorly into a process which is elongate and troughlike or shorter and spoonlike, median length exceeding transocular width, anterior margin carinate, ocelli located on or slightly behind a line between anterior angles of eyes, each slightly closer to midline than to adjacent eye angle, without a median M-shaped elevation bordering posterior margin, with narrow median fovea which broadens greatly at base of median process, without a longitudinal carina laterad of each ocellus, disc finely pubescent; antennal ledges each with a longitudinal fovea in dorsal aspect, in lateral aspect carinate dorsally, anterior margins steeply declivous; clypeus concave medially, the concavity extending dorsally to anterior margin of apical process, muscle impressions distinct; transclypeal suture obsolete; face finely pubescent below; clypellus protuberant and rounded, contour of its lower margin not continuing profile of clypeus.

Thorax with pronotum slightly narrower than transocular width of head, lateral margins subparallel, occasionally slightly concave at midlength, almost entire surface deeply punctate, the punctures each bearing a short seta, posterior margin concave, with complete dorsopleural carinae, each of which is arched slightly downward at midlength; scutellum transversely striate in posterior half.

Forewing with membrane including all of apical cells, veins not very distinct except at apex, basal half of clavus punctate, clavus and corium coriaceous, with only four apical cells, the relative positions of bases of the third and fourth somewhat variable, without an anteapical plexus of veins on corium, usually with a few anteapical veins to costal margin, wings of female at rest exceeding ovipositor. Hindwing extending almost as far posteriorly as forewing; vein R_{2+3} obsolete. Hindlegs with, setal formula 2 : 0 : 0 or 2 : 1 : 0; first tarsomere with length less than combined length of second and third.

Male genitalia: Pygofer variable in form and chaetotaxy, with or without a terminal process. Plates fused basally, extending farther posteriorly than apex of pygofer, triangular, with numerous dispersed microsetae or small macrosetae. Style elongate, slender, extending much farther posteriorly than apex of connective, without preapical lobe, rounded apically, with a few lateral microsetae in apical third. Connective Y-shaped, with or without a median keel. Aedeagus symmetrical or not, curved gradually posteriorly and dorsally, with various anteapical and apical processes. Paraphyses absent.

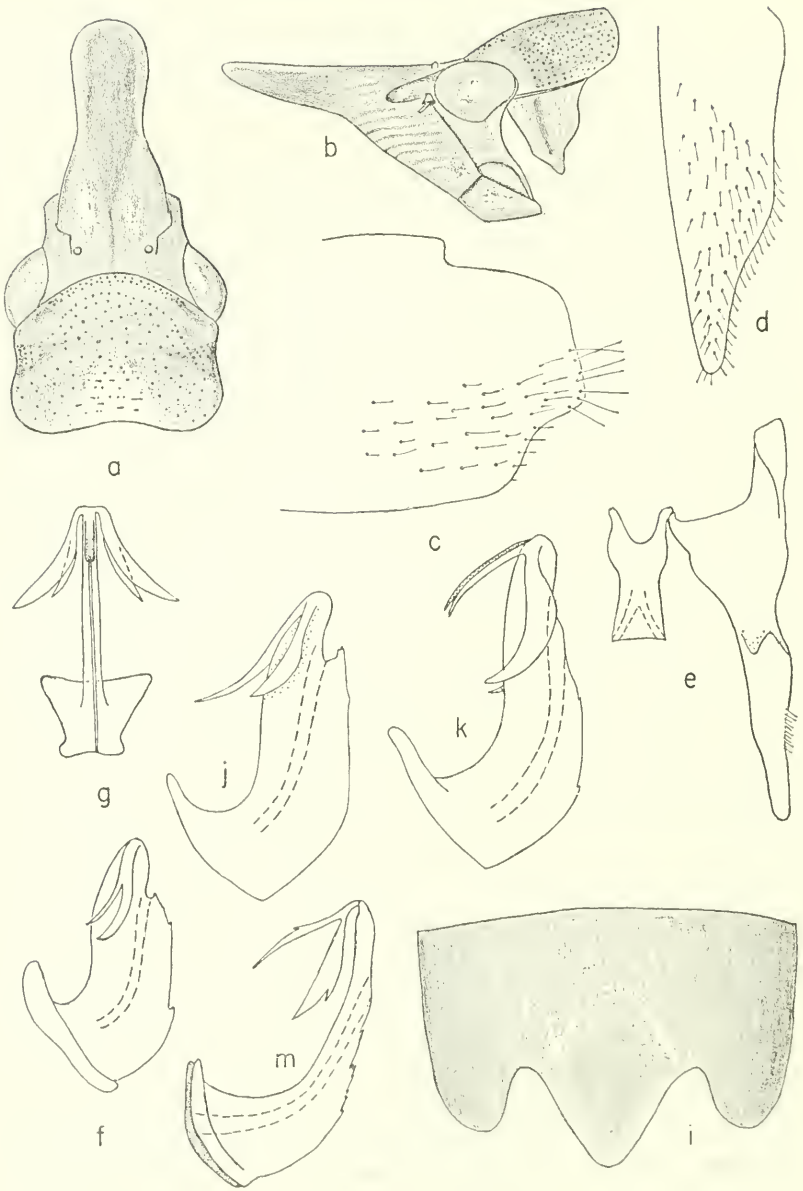


FIGURE 127.—*Ichthyobelus bellicosus* Melichar (**a-i** from specimens from Ixiamas, Bolivia; plate not shown in **c**): **j,** aedeagus, lateral view, lectotype; **k,** as in **j** but from specimen from Tingo María, Peru; **m,** specimen from unknown locality (apical processes unilateral).

Female abdominal sternum VII strongly trilobate.

A number of specimens belonging to this genus have been examined from the upper Amazon valley and tributaries from Peru and Bolivia. There appears to be a considerable amount of variation in the form of the aedeagus. *Ichthyobelus* is closely related to *Catorthorrhinus* in the treatment of which distinguishing characters are stated.

SPECIES OF ICHTHYOBELUS

bellicosus Melichar, 1925a:361. Ecuador, Peru, Bolivia.
nasutus, new species. Peru.
platyrrhinus, new species. Peru.
regularis, new species. Brazil.

KEY TO MALES OF ICHTHYOBELUS

1. Head with apical process spoon-shaped, short and broad. . . . 2
   Head with process more slender and elongate, trough-shaped.
   I. bellicosus Melichar (fig. 127)
2. Pygofer with a terminal, elongate process, aedeagal shaft with a pair of processes near midlength and no additional processes.
   I. platyrrhinus, new species
   Without the above combination of characters. 3
3. Pygofer smoothly rounded at apex, aedeagus symmetrical.
   I. regularis, new species (138)
   Pygofer truncate at apex, aedeagus asymmetrical.
   I. nasutus, new species (139)

Ichthyobelus platyrrhinus, *new species*

FIGURE 128

Length 14 mm. Head with anterior process spoon-shaped, much broader than in *I. bellicosus* Melichar. Posterior femoral setal formula 2:1:0. Male pygofer without setae, produced posteriorly in a postero-ventral elongate process which bears a shorter process at about midlength, aedeagus quite short and very broad, with a pair of ventral recurved processes at midlength, without apical processes. Anal tube with a ventral, rounded process on each side. Color dull yellow, with median and lateral margins of head process, two transverse stripes across pronotum, four transverse wing stripes attaining commissural margin, and a few additional markings on forewings, brown to black; these additional markings of forewings delimiting a pair of spots on corium opposite claval apex, and an elongate transverse marking before the antcapical cells, all three of which are yellow; face with a conspicuous dark spot in middle of clypeus.

260-649—68——10

Holotype male and one male paratype, Río Santiago, Peru, and two additional males from upper Río Marañon, Peru (AMNH).

This species is closely related to and closely resembles the two new species below. Distinguishing characters are mentioned in the descriptions which follow.

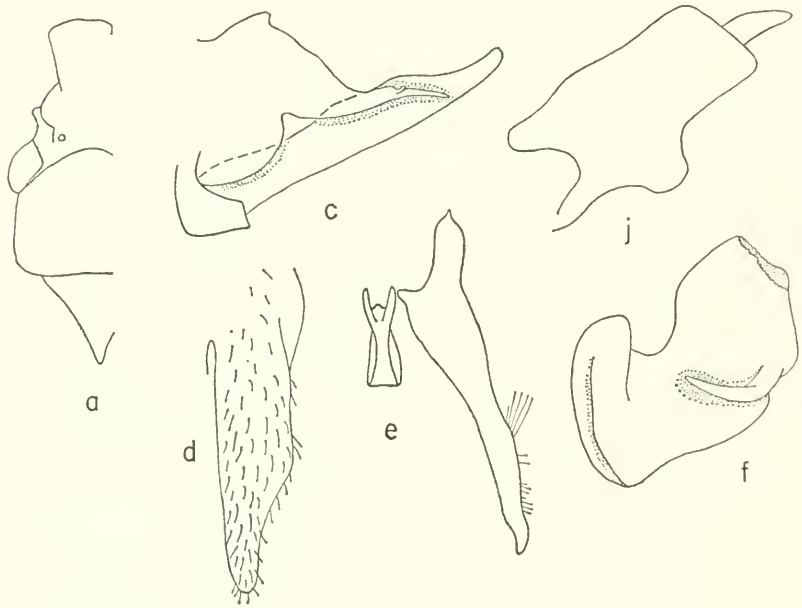


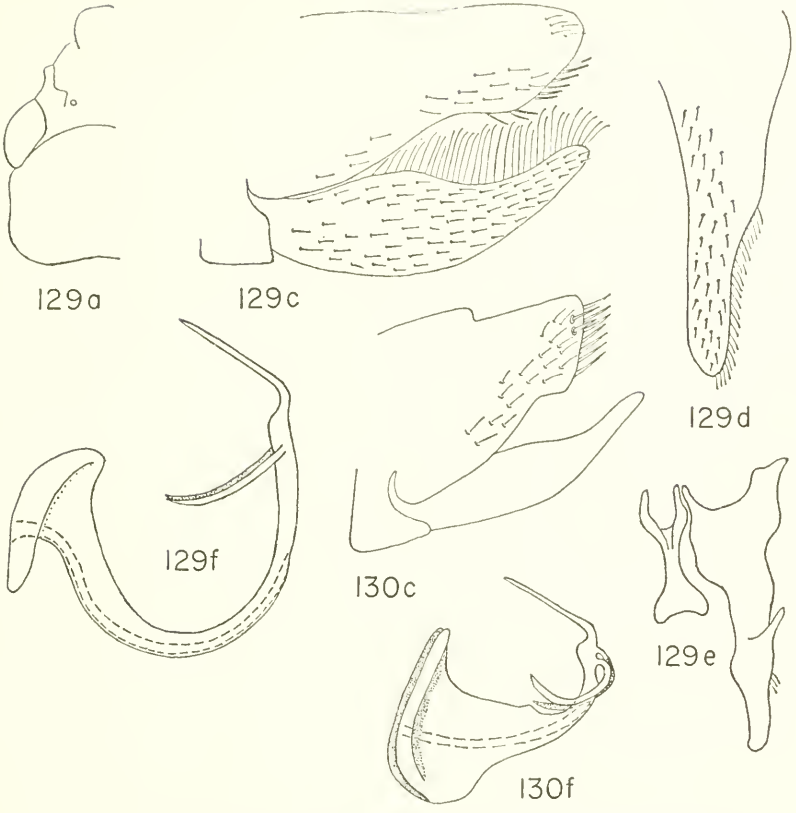
FIGURE 128.—*Ichthyobelus platyrrhinus*, new species, holotype: j, anal tube, lateral view.

Ichthyobelus regularis, *new species*

FIGURE 129

External characters as in *I. platyrrhinus*, new species, except that there is no black spot on middle of clypeus. Male pygofer not strongly produced, broadly rounded apically, with apical group of macrosetae and a few microsetae on disc before these; plates shorter than in *I. platyrrhinus* and with setae larger; aedeagus symmetrical, slender, with a pair of elongate tapering lateral processes extending anteriorly but regularly and slightly curved dorsally, apex with an unpaired slender elongate process directed anteriorly and dorsally, dorsal margin with strong angulation before midlength. Female abdominal sternum VII as in *I. bellicosus* Melichar (fig. 127i), except that median posterior lobe is much longer.

Holotype male labeled "Amazon./Fonteboa," a male topotype, and a pair of specimens, Rio Purus, Brazil, all in RMS.



FIGURES 129, 130.—**129,** *Ichthyobelus regularis*, new species, specimen from Rio Purus, Brazil. **130,** *I. nasutus*, new species, holotype.

This species is very closely related to the preceding and the following species, from both of which it can be distinguished by characters in the key and the descriptions.

Ichthyobelus nasutus, *new species*

FIGURE 130

External characters as in *I. regularis*, new species, except that the posterior femoral setal formula is 2:0:0. Male pygofer not strongly produced posteriorly, obliquely truncate apically, setae much as in *regularis;* aedeagus in lateral aspect as in *regularis*, but with a pair of processes arising serially from ventral margin, dorsal margin with angle much less prominent, occurring at midlength of shaft.

Holotype male, "Achinamiza," Peru, Sept. 18, 1927 (AMNH).

29. Genus CATORTHORRHINUS Fowler

FIGURE 131

Catorthorrhinus Fowler, 1898a:213. Type-species: *C. resimus* Fowler (1898a:213), by monotypy.

Length of male 12 mm.

Head as in *Ichthyobelus*, but with apical process narrower, sulcate dorsally, and directed more dorsad, in lateral aspect almost forming a right angle with surface of disc, with each ocellus about equidistant between adjacent anterior angle of eye and midline of crown.

Thorax as in *Ichthyobelus*, but with dorsopleural carinae obsolete and with transverse striae of scutellum obscure. Forewing as in *Ichthyobelus*, with bases of third and fourth apical cells in same transverse line. Hindwing extending almost as far posteriorly as apex of forewing; vein R_{2+3} incomplete. Hindlegs as in *Ichthyobelus*, with femoral setal formula 2:1:0.

Male genitalia: Pygofer with an undifferentially sclerotized projection on dorsal margin, posterior margin rounded, posterior half of disc with numerous dispersed microsetae, without processes. Plates fused basally, extending posteriorly beyond pygofer apex, each with numerous microsetae and a number of macrosetae on disc, without setae near

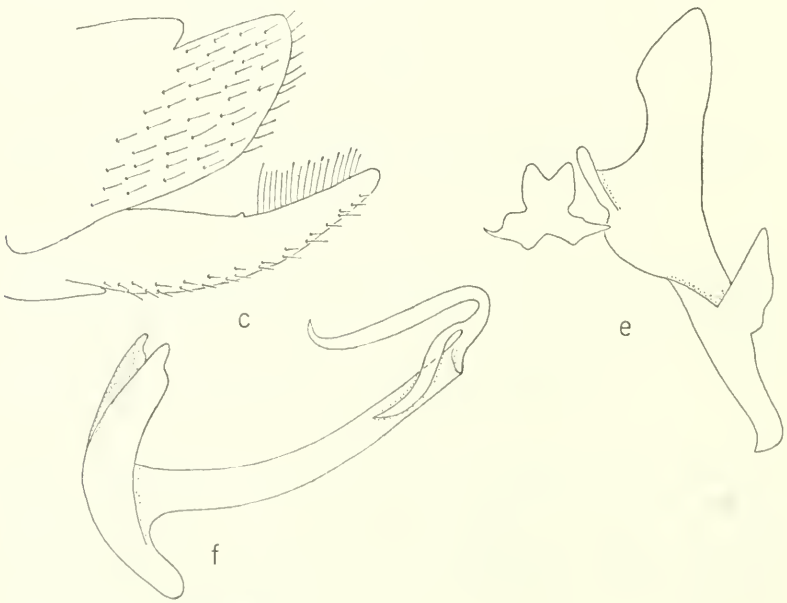


FIGURE 131.—*Catorthorrhinus resimus* Fowler, specimen from Portrerillos, Panama.

mesal margin. Style elongate, extending posteriorly much beyond apex of connective, without preapical lobe, apex with a mesal angle. Connective with four arms, the posterior pair widely divergent. Aedeagus asymmetrical, curved very slightly dorsally, apex with a pair of asymmetrical processes. Paraphyses absent.

Female unknown.

Catorthorrhinus is known only from the type-species, which is known only from Panama and Costa Rica. It is very closely related to *Ichthyobelus*, differing in the characters mentioned in the key and in the above description. The type-species is poorly represented in collections, specimens having been seen only in BM, MMB, and NCS.

The genitalia of the male lectotype of the type-species agree with the illustrations in figure 131.

30. *Genus* SPLONIA Signoret

FIGURES 132–134

Splonia Signoret, 1891a:467. Type-species: *S. acutalis* Signoret, by monotypy.

Syringophora Kirkaldy, 1907d:87. Type-species: *Rhaphirrhinus brevis* Walker, by original designation. New synonymy.

Papallacta Schmidt, 1932a:47. Type-species: *P. haenschi* Schmidt, by original designation and monotypy. New synonymy.

Length 14–16 mm.

Head with crown moderately to well produced with an apical process which extends anterodorsally, ocelli much closer to posterior margin than to apex, located on a line between anterior angles of eyes and each either equidistant between midline and adjacent anterior eye angle or slightly closer to latter, without an M-shaped elevation bordering posterior margin, without a longitudinal carina laterad of each ocellus, without a median fovea, surface with fine pubescence; antennal ledges in lateral aspect each with a longitudinal fovea, in lateral aspect carinate dorsally, anterior margin steeply declivous; clypeus strongly convex or depressed medially, muscle impressions distinct; face finely pubescent; clypellus produced and angulate, in profile with its lower portion at right angle to contour of clypeus.

Thorax with pronotal width greater or less than transocular width of head, lateral margins subparallel or slightly convergent anteriorly, surface punctate, with fine pubescence, posterior margin concave, with or without dorsopleural carinae which are arched ventrally at midlength when present; scutellum striate or not on posterior portion. Forewing brachypterous, without a membrane, strongly coriaceous, venation obscure, with a few elevated rugosities, at rest extending posteriorly to base of abdominal tergum VI; or macropterous with

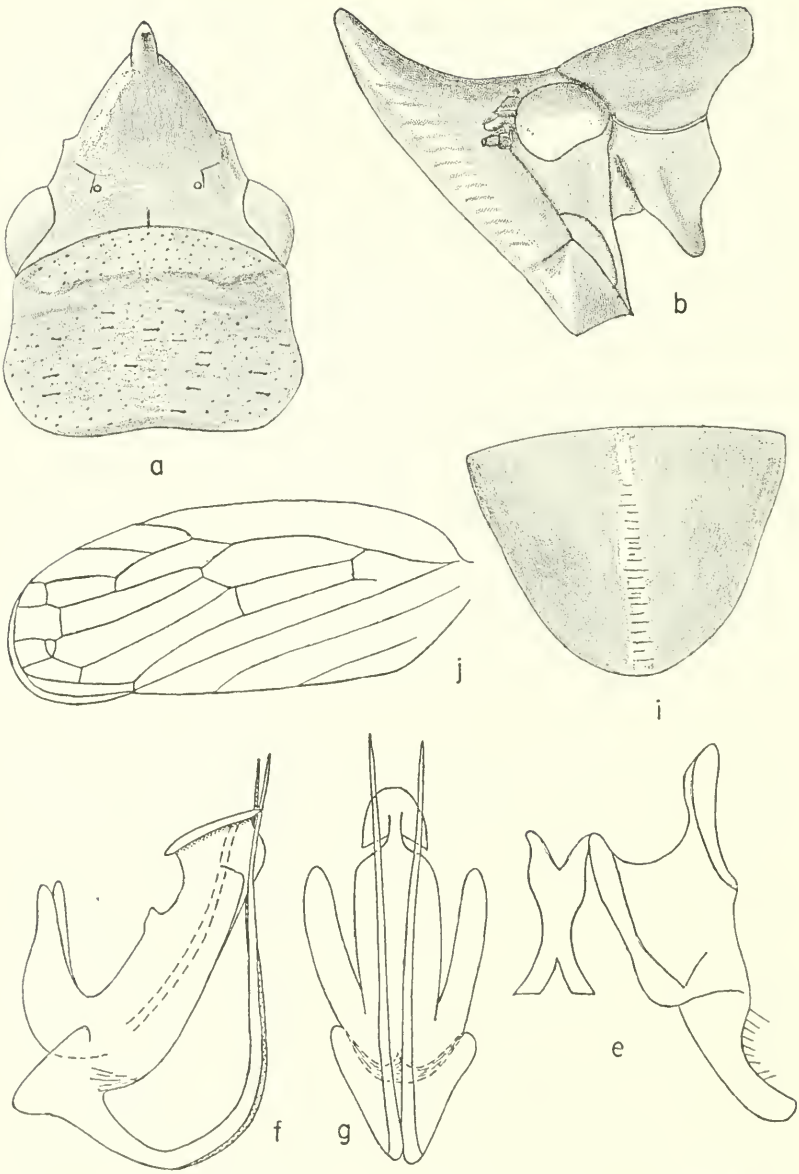
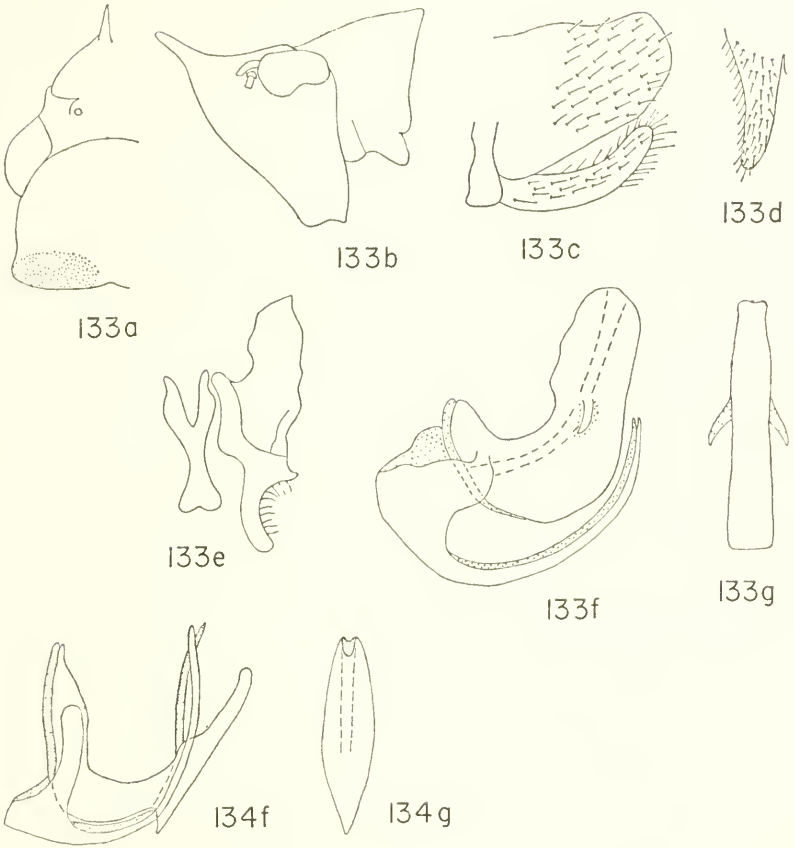


FIGURE 132.—*Splonia brevis* (Walker), specimen from Baños, Ecuador: j, forewing.



FIGURES 133, 134.—**133,** *Splonia acutalis* Signoret, from lectotype of *S. haenschi* (Schmidt); shaded area orange in **a,** outline only shown in **b.** **134,** *S. nasti*, new species, holotype; paraphyses included in **f.**

membrane including only inner apical cell, coriaceous and punctate, with veins indistinct, with more than four apical cells, disc without supernumerary veins, but with supernumerary veins to costal margin in apical half, female with apex of ovipositor exposed when wings in rest position. Hindwing extending about as far posteriorly as forewing when brachypterous, not as far when macropterous, vein R_{2+3} entire in both forms, apical margin quite broad and falcate in macropterous form. Hindlegs with setal formula 2:0:0; first tarsomere shorter than combined length of second and third; in rest position with knees attaining posterior proepimeral margins.

Male genitalia: Pygofer moderately to well-produced, with posterior margin rounded or obliquely truncate, with numerous dispersed

microsetae, without processes. Plates separate throughout length or fused basally, not extending as far posteriorly as pygofer apex, triangular, with numerous dispersed microsetae. Style extending farther posteriorly than apex of connective, with preapical lobe, rounded apically, with lateral microsetae arranged serially behind preapical lobe. Connective Y-shaped, with arms not widely divergent, stem longer than arms and not strongly carinate. Aedeagus symmetrical, with a pair of elongate slender processes or paraphyses arising basiventrally, extending parallel to shaft, which is curved gradually posterodorsally; shaft with a pair of retrorse processes or an unpaired process near midlength. Paraphyses—see above, under aedeagus.

Female abdominal sternum VII produced and with apical margin broadly rounded or slightly emarginate apically.

Splonia is known only from Ecuador and Venezuela. The holotype of *Splonia acutalis* Melichar, in the Signoret collection in Vienna, bears the erroneous locality label "Senegal." The posterior femora are unusually long for proconiine leafhoppers. The generic affinities are unknown, and *Splonia* appears to occupy a position well apart from other proconiine genera.

SPECIES OF SPLONIA

acutalis Signoret, 1891a:468. Ecuador.
haenschi (Schmidt), 1932a:49 (*Papallacta*). New synonymy.
brevis (Walker), 1851b:807 (*Rhaphirrhinus*). Venezuela. New combination.
nasti, new species. Ecuador.

KEY TO MALES OF SPLONIA

1. Head gradually tapered to apical process; clypeus convex medially; aedeagus in caudoventral aspect with an anteapical constriction. S. brevis (Walker) (fig. 132)
   Head with apical process thornlike, arising abruptly; aedeagus not as above. 2
2. Aedeagal shaft in lateral aspect narrow, with a ventral unpaired process. . . . . S. nasti, new species
   Aedeagal shaft in lateral aspect broad, with paired, retrorse lateral processes. . . . . S. acutalis Signoret (fig. 133)

Splonia nasti, *new species*

FIGURE 134

Length to apex of abdomen 14 mm. Head with crown moderately produced, median length less than interocular width, abruptly narrowed apically to base of apical process which is short and thornlike; clypeus depressed medially in its dorsal portion. Thorax with pronotal

width greater than transocular width of head, lateral margins subparallel, without dorsopleural carinae, scutellum not striate on posterior portion. Forewings brachypterous, in rest position attaining base of tergum VI, without a membrane, surface strongly coriaceous with venation obscured, with a few elevated rugosities near middle of wing. Male genitalia much as in *S. brevis* (Walker) (fig. 132), pygofer obliquely truncate apically, thickly beset with small microsetae; plates extending almost as far posteriorly as pygofer apex, separate throughout their length; styles as in *brevis* (Walker); aedeagus with shaft narrow in lateral aspect, with a slight convexity near midlength of dorsal margin, with an unpaired retrorse process near midlength of ventral margin, without an anteapical constriction in shaft in posteroventral aspect; paraphyses closely associated with aedeagal shaft basally. Color of anterior dorsum and forewings dull brown, abdomen and legs black.

Holotype male and one additional male, Mácas, Oriente, Ecuador (J. B. Rorer), July (USNM).

This species differs from both *S. brevis* (Walker) and *S. acutalis* Signoret in the much narrower aedeagal shaft and in the unpaired ventral shaft process. It is named in honor of Dr. Janusz Nast of the Polish Academy of Sciences, who has been extremely cooperative in making available specimens from his institution, and in a number of other ways.

31. Genus OCHROSTACTA Stål

FIGURES 135, 136

Ochrostacta Stål, 1869a:61. Type-species [*Tettigonia*] *diadema* Burmeister, by subsequent designation of Kirkaldy, 1907d:88.

Andamarca Melichar, 1926a:336. Type-species: *Tettigonia physocephala* Signoret, by original designation and monotypy. New synonymy.

Length 9–12.5 mm.

Head strongly produced, anterior margin rounded to face, ocelli located before line between anterior angles of eyes, each about equidistant between adjacent eye angle and median line, crown inflated, surface varying interspecifically from glabrous to very coarsely pitted and with anterolateral projections, without an M-shaped elevation bordering posterior margin, without a longitudinal carina laterad of each ocellus, without setae, lateral clypeal sutures extending onto crown or not, not attaining ocelli when present; antennal ledges not foveate, in lateral aspect carinate dorsally, anterior margins steeply declivous; clypeus convex or flattened, muscle impressions distinct or completely absent, transclypeal suture distinct or obscure; face not pubescent; clypellus not produced, its contour continuing profile of clypeus.

Thorax with width less than transocular width of head, lateral margins slightly divergent anteriorly, posterior two-thirds of disc transversely striate, without pubescence, posterior margin concave, with very strong dorsopleural carinae which are rectilinear or curved slightly ventrally at midlength; scutellum transversely striate on posterior portion. Forewing without a membrane, veins distinct or not, surface coriaceous, with only four apical cells, the base of the third located more distally than base of fourth, without an anteapical plexus of veins in corium and without anteapical supernumerary veins to costal margin, wings of female at rest scarcely attaining apex of ovipositor. Hindwing extending almost as far posteriorly as forewing, with vein R_{2+3} incomplete. Hindlegs with femoral setal formula 2:0:0; first tarsomere not longer than combined length of second and third.

Male genitalia: Pygofer moderately produced posteriorly, broadly to narrowly rounded at apex, with a few anteapical macrosetae or with numerous microsetae on posterior two-thirds of disc, without processes. Plates separate throughout their length, which is variable interspecifically with relation to pygofer apex, triangular, with numerous dispersed microsetae. Connective somewhat Y-shaped, with a median keel. Style extending posteriorly as far as or farther than apex of connective, with distinct preapical lobe, truncate or foot-shaped at apex. Aedeagus symmetrical, of moderate length, not curved dorsally, without processes. Paraphyses present, with paired basal and paired apical rami.

Female abdominal sternum VII with posterior margin transverse, ocasionally slightly emarginate at middle.

The greatly modified head in *Ochrostacta* separates it readily from other genera in the tribe. Its relationships to other genera are unknown. On the basis of the head alone, the two species might readily be placed in different genera, but the heads are alike in being bizarre, and the forewings and male genitalia have a number of similarities. The genus is known only from southeastern Brazil, northern Argentina, Uruguay, and Paraguay.

SPECIES OF OCHROSTACTA

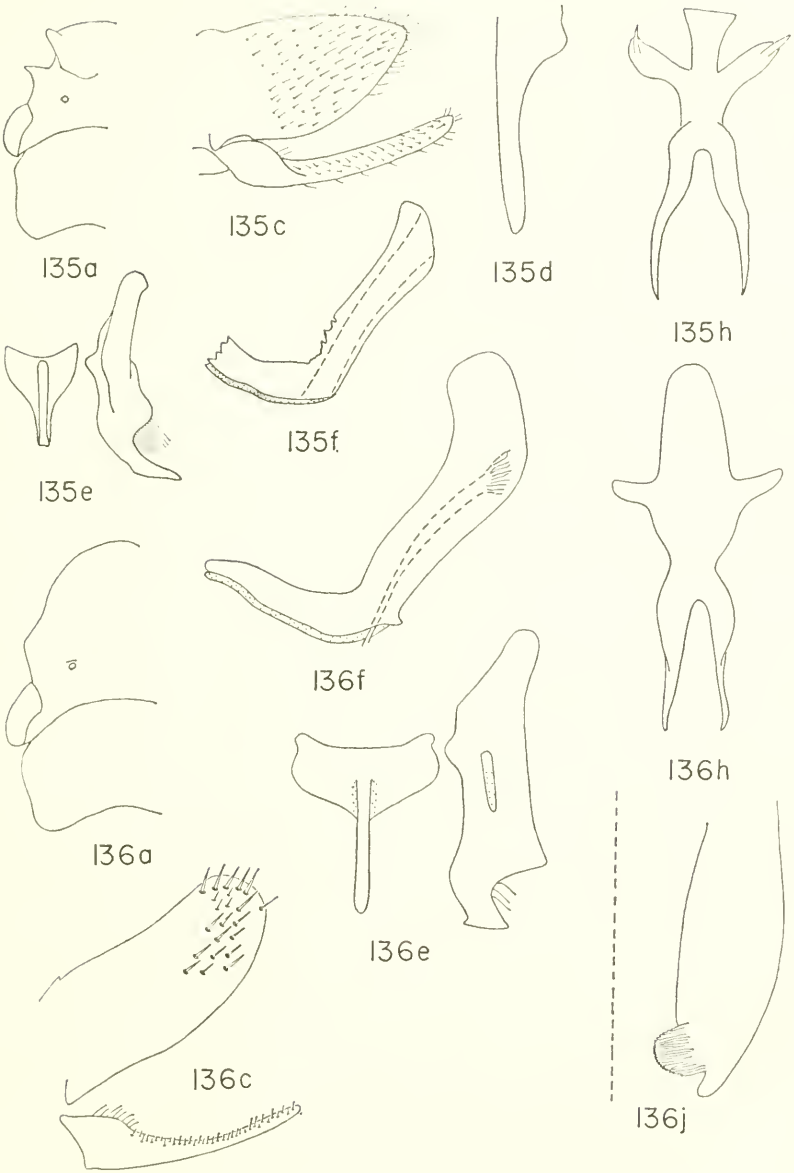
[*Type not seen.]

**diadema* (Burmeister), 1835a:120 (*Tettigonia*). SE. Brazil.
physocephala (Signoret), 1854d:720 (*Tettigonia*). Paraguay, N. Argentina.

KEY TO SPECIES OF OCHROSTACTA

Antennal ledges very strongly protuberant, crown coarsely pitted anteriorly, with a lateral apical process on each side.
O. diadema (Burmeister) (fig. 135)

Antennal ledges not strongly produced, crown glabrous anteriorly, without such processes . . **O. physocephala** (Signoret) (fig. 136)



FIGURES 135, 136.—**135,** *Ochrostacta diadema* (Burmeister), specimen from Rio Grande do Sul, Brazil; setae not shown in **d,** dorsal view shown in **h. 136,** *O. physocephala* (Signoret), specimen from Rio Grande do Sul, Brazil (plate shown in ventral view in **c,** in dorsal view in **h**): **j,** pygofer apex, left side caudoventral view.

32. Genus ABANA Distant

FIGURES 137–139

Abana Distant, 1908b:72. Type-species: *Aulacizes dives* Walker, by original designation.

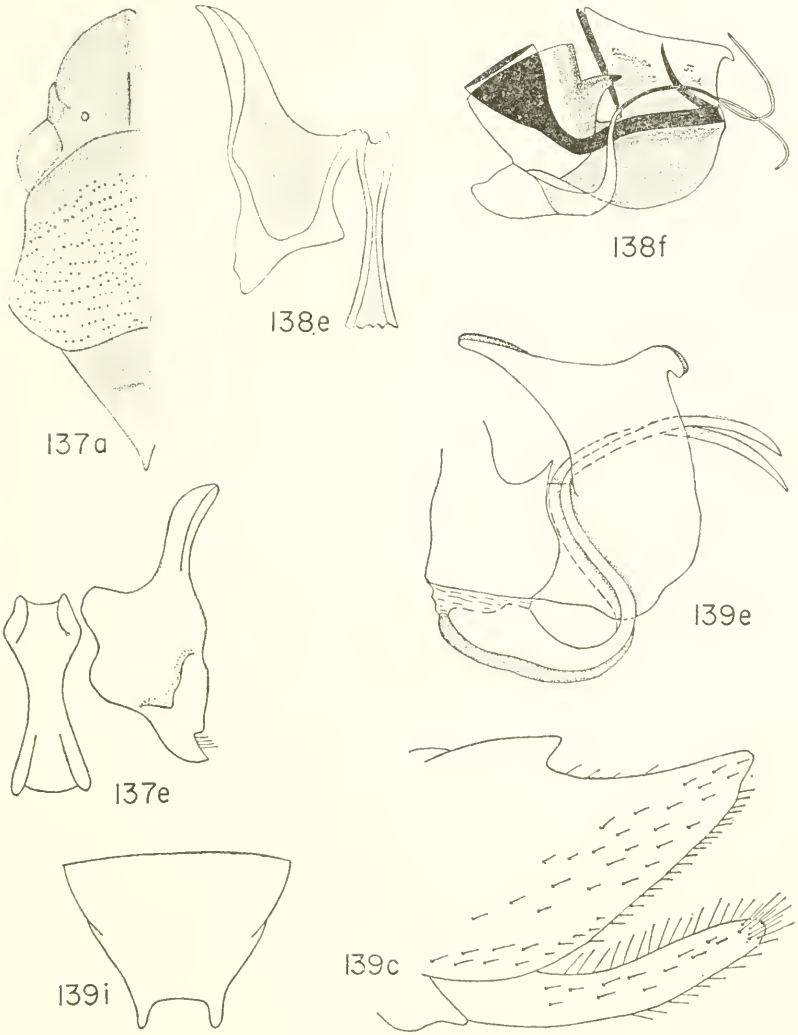
Mesobana Melichar, 1926a:322. Type-species: *Amblydisca pomposula* Jacobi, by subsequent designation of Metcalf, 1965a:645.

Length 17–20 mm.

Head well produced, median length usually equal to or exceeding interocular width, apex carinate or not, ocelli located on or slightly behind a line between anterior eye angles, each ocellus equidistant between midline of crown and adjacent anterior eye angle or slightly nearer latter, nearly always with an M-shaped elevation bordering posterior margin, with or without a median longitudinal fovea, without a longitudinal keel laterad of each ocellus, disc without pubescence; antennal ledges in lateral aspect nearly always longitudinally sulcate and carinate dorsally, anterior edges steeply declivous; clypeus depressed or at least flattened, muscle impressions distinct; face finely pubescent below; clypellus protuberant, its contour almost at right angle to profile of face, without a median carina.

Thorax with pronotal width exceeding transocular width of head, lateral margins convergent anteriorly, disc declivous anteriorly, punctate and occasionally rugose, without pubescence, in lateral aspect with complete dorsopleural carina which is arched slightly downward at midlength, posterior margin concave; scutellum transversely striate in posterior half. Forewing with or without an apical membrane (intraspecifically inconstant), veins elevated and distinct, clavus and corium strongly coriaceous, both usually conspicuously punctate, with four apical cells, the base of fourth more distal than base of third, without an anteapical discal plexus of veins on corium but with anteapical supernumerary veins to costal margin; wings of female at rest concealing apex of ovipositor or not. Hindwing at rest extending nearly as far posteriorly as apex of forewing; vein R_{2+3} obsolete. Hindlegs with femoral setal formula 2:0:0, 2:1:0, or 2:1:1; first tarsomere shorter than combined length of second and third.

Male genitalia: Pygofer in lateral aspect angularly produced, abruptly narrowed on dorsal margin near midlength, with sparse microsetae uniformly distributed over disc, without processes. Plates separate throughout their length, extending not quite as far posteriorly as pygofer apex, triangular, with lower pygofer margins tightly pressed against their lateral margins in dried specimens, each plate with a number of dispersed microsetae. Style very short, extending about as far posteriorly as apex of connective, with preapical lobe, apex acute. Connective narrowly Y-shaped, with stem much longer than arms, gradually broadened apically, not keeled. Aedeagus symmetrical with



FIGURES 137–139.—**137,** *Abana arnetti,* new species, holotype. **138,** *Abana* sp., specimen from Panama. **139,** *A. horvathi* Jacobi: male specimen from Cuzco, Peru; female from lectotype of *A. subfasciata* Melichar.

a pair of very broad, conspicuous, lateral, quadrate processes, with a median, slender process between them extending dorsally and anteriorly, with a short, unpaired, conical process near base of shaft and a pair of basal, loosely attached, elongate slender processes extending between the quadrate processes and exceeding shaft apex.

Female abdominal sternum VII strongly produced posteriorly and either acute or broadly emarginate apically.

The genus *Abana* occurs in Central America, Colombia, Ecuador, Peru and Bolivia. The species are closely related morphologically, the male genitalia being very similar in the species of which males were available for study. Several species are known from only one sex. Colors apparently vary somewhat with the time elapsed after the last moult. Series are very short in most collections, and until better series are available it seems inadvisable to try to construct a key to species. In the species of which males have been studied, all have been teneral except in those with black forewings. The genus is related to *Deselvana* and *Omagua*, from both of which it can be distinguished by the contour of the clypellus, of which the lower part is at an angle to the profile of the clypeus.

The female lectotype of *Abana drusilla* Distant is merely a teneral form of *A. dives* (Walker). The male genitalia of the holotype of the latter are as in the illustration of *Abana horvathi* Jacobi (fig. 139). This is true also of the male genitalia of the lectotype of *A. haupti* Melichar, and the lectotype of *A. pomposula* Jacobi. The female lectotype of *A. subfasciata* var. *albidipennis* Melichar is a teneral specimen conspecific with the female lectotype of *A. subfasciata* Melichar, both of which appear to be synonymous with *A. horvathi*, as does the female lectotype of *A. puella* Schmidt. The male genitalia of a male topotype of *A. tissa* Distant were like those illustrated for *A. horvathi*.

SPECIES OF ABANA

[*Type not seen.]

arnetti, new species. Panama.
dives (Walker), 1851b:791 (*Aulacizes*). Ecuador.
    drusilla Distant, 1908b:73. New synonymy.
gigas (Fowler), 1898a:212 (*Amblydisca*). Costa Rica, Ecuador.
haupti Melichar, 1926a:324. Peru.
horvathi Jacobi, 1905c:166. Colombia, Peru, Bolivia.
    pomposula (Jacobi), 1905c:167 (*Amblydisca*). New synonymy.
    **regia* Melichar, 1926a:324. New synonymy.
    sonora Melichar, 1926a:324. New synonymy.
    subfasciata Melichar, 1926a:325. New synonymy.
    subfasciata var. *albidipennis* Melichar, 1926a:325.
    puella Schmidt, 1928a:51. New synonymy.
tissa Distant, 1908b:73. Ecuador.

Abana arnetti, *new species*

FIGURE 137

Length 17.5 mm. Head with median length exceeding interocular width, without a distinct M-shaped elevation bordering posterior

margin, without distinct median longitudinal fovea, antennal ledge in lateral aspect longitudinally sulcate and carinate dorsally, clypeus flattened on disc. Pronotum rugose and punctate. Forewing without a membrane. Posterior femoral setal formula 2:1:0. Other anatomical characters as in generic description. Color mostly brown, crown of head yellow except for two angular areas on posterior portion extending from sutures posteriorly to posterior margin, pronotum castaneous, except for broad marginal area behind anterior margin, forewings very dark brown, almost black except basally, upper two-thirds of clypeus dull yellow.

Holotype male, Barro Colorado Island, Panama C.Z., Nov. 22–24, 1944 (R. H. Arnett, Jr.), at light (USNM); and a series of 23 specimens of both sexes, Gatún, C.Z., September and March, and Barro Colorado Island, July (CAS).

A. arnetti, new species differs from most of the others in the genus in its lack of a longitudinal coronal fovea, the posterior femoral setal formula, the lack of an M-shaped elevation on the posterior portion of the crown, and in the flattened clypeus, which is usually depressed in other species of *Abana*.

33. DESELVANA, *new genus*

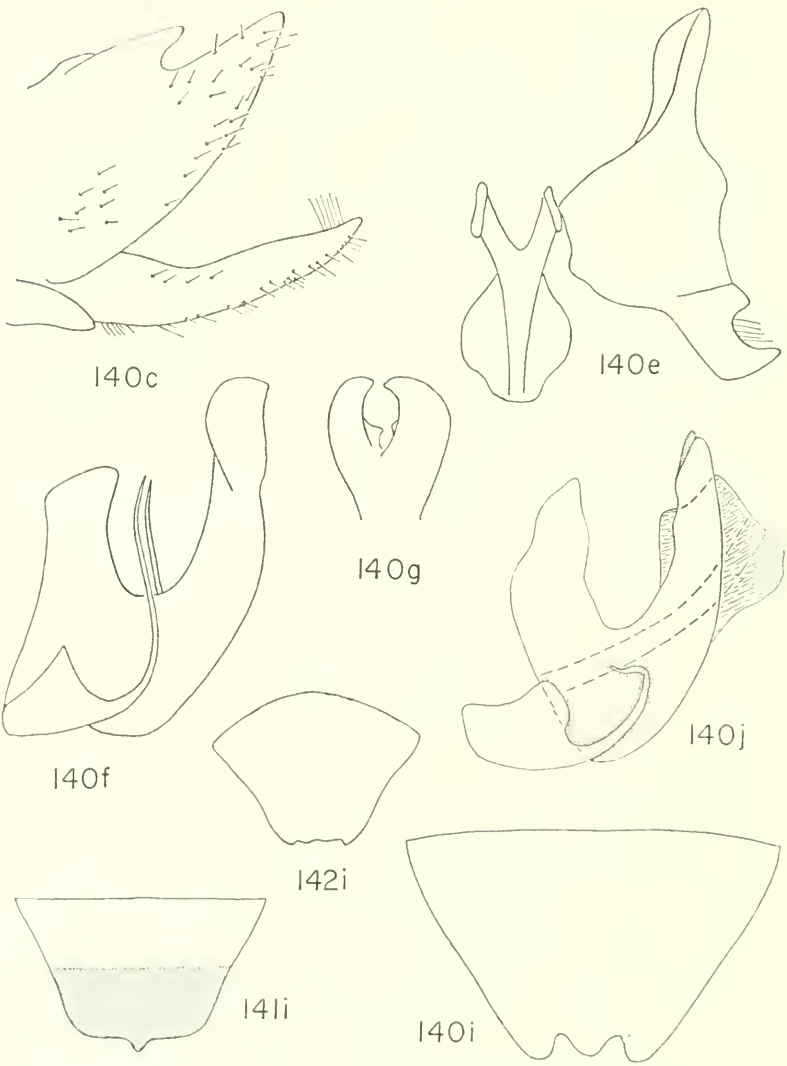
FIGURES 140–146

Type-species: *Proconia excavata* Le Peletier and Serville.

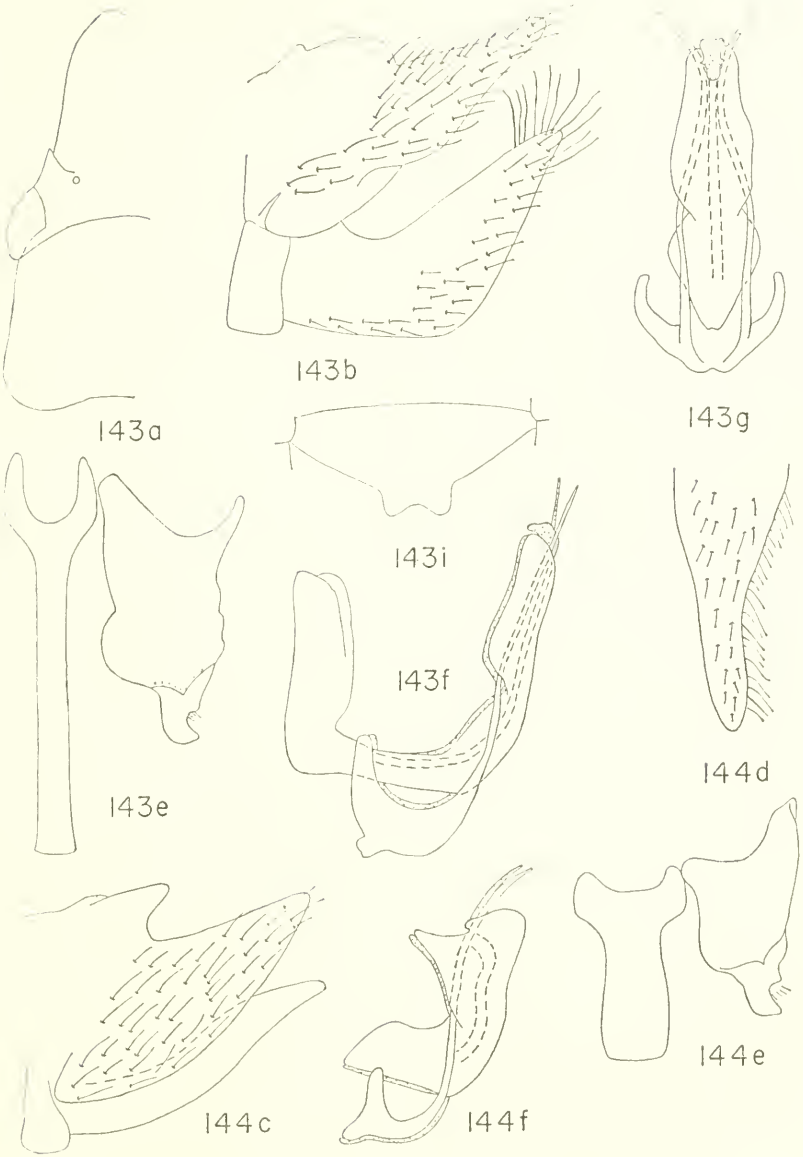
Length 12–21 mm.

Head strongly produced, median length greater than interocular width, apex slightly elevated and carinate at transition from crown to face, ocelli located on a line between anterior angles of eyes, with or without a median M-shaped elevation bordering posterior margin, with a median longitudinal fovea which is expanded apically or not, without a longitudinal carina laterad of each ocellus, disc with or without microsetae; antennal ledges in lateral aspect with or without a longitudinal concavity, anterior margin declivous; clypeus flattened medially, usually depressed beneath apex, muscle impressions distinct; face usually pubescent beneath; clypellus not produced, its contour continuing profile of clypeus.

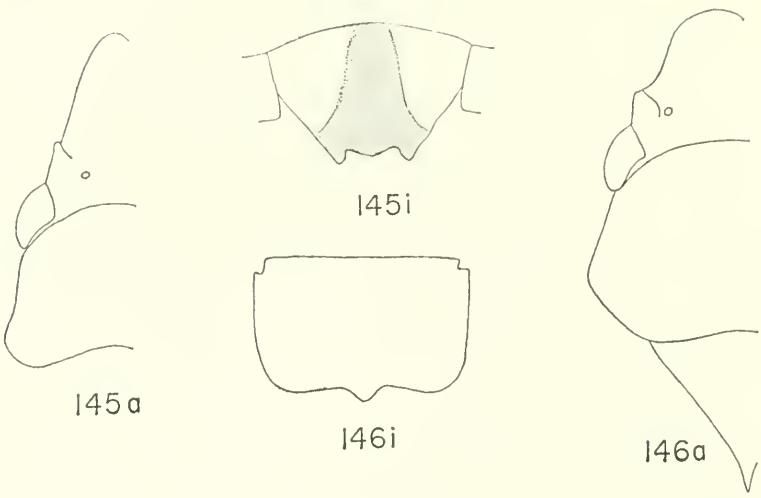
Thorax with pronotal width variable, less or greater than transocular width of head, lateral margins varying from nearly parallel to convergent anteriorly, disc punctate (sometimes rugose also), with or without pubescence, posterior margin concave, in lateral aspect with a complete dorsopleural carina which is arched ventrally at middle; scutellum transversely striate in posterior portion. Forewing with membrane of variable extent, often not sharply differentiated from



FIGURES 140–142.—**140,** *Deselvana excavata* (Le Peletier and Serville) (**c**-**g** from specimen from Santa Catarina, Brazil (paraphyses shown in **f**); **i**, from Campo Belo, Brazil): **j**, aedeagus and paraphyses, lateral view, specimen from Hansa, Brazil. **141,** *D. simulans* (Schmidt), lectotype. **142,** *D. falleni* (Stål), lectotype.



FIGURES 143, 144.—**143,** *Deselvana dorsivitta* (Walker): **b-g** from specimen from French Guiana; **a, i,** lectotype of *D. castanea* (Melichar). **144,** *D. longipennis* (Melichar), lectotype.



FIGURES 145, 146.—**145,** *Deselvana castanoptera* (Melichar), lectotype. **146,** *D. ezba* (Distant), lectotype.

remainder of wing, veins elevated and distinct, clavus (and occasionally also corium) punctate, with four or more apical cells, the relative lengths of third and fourth variable, claval veins parallel, corium with or without discal supernumerary anteapical veins, usually with supernumerary anteapical veins to costal margin, wings of female at rest concealing apex of ovipositor or not. Hindwing at rest extending almost as far posteriorly as forewing, vein R_{2+3} interrupted. Front leg with tibia broadly expanded; hindleg at rest with knee not attaining posterior proepimeral margin, femoral setal formula 2:0:0, first tarsomere shorter than combined length of second and third.

Male genitalia: Pygofer strongly triangularly produced posteriorly, in lateral aspect with a concavity in posterior half of dorsal margin, with a number of setae on lower portion extending from near base to apex, without processes. Plates separate throughout their length, extending as far or almost as far posteriorly as pygofer apex, each triangular and with a number of dispersed microsetae. Style extending as far posteriorly as apex of connective or not, with preapical lobe, apical portion foot-shaped with toe directed laterad. Connective Y-shaped with arms divergent, each shorter than stem. Aedeagus symmetrical, curved gradually posterodorsally with paired apical or anteapical processes. Paraphyses paired, closely associated with aedeagus at their bases, in some species extending between the lateral aedeagal processes.

Female abdominal sternum VII slightly to considerably produced with apex variable interspecifically.

This genus apparently ranges from Panama to southern Brazil and Peru, but no specimens have been seen from Venezuela. A number of the species are known from only one sex, making the construction of a key impractical at this time. *Deselvana* is closely related to *Rhaphirrhinus*, *Abana*, and *Omagua* with which it shares the distinctive form of the dorsal margin of the pygofer. It differs from *Omagua* externally by its more produced head and in the male genitalia by the lack of the very large gonopore that occurs in *Omagua*. It is readily distinguished from *Rhaphirrhinus* by the lack of the threadlike apical head process in *Deselvana*. Distinguishing characters for *Abana* are set forth in the discussion of that genus (p. 150).

The female lectotype of *Deselvana simulans* (Schmidt) agrees with the illustration in figure 141. The genitalia of the male holotype of *D. dorsivitta* (Walker) agree with male genitalia in figure 143, except for the presence of a moderate number of small spines on the pygofer which were not present in the specimen illustrated.

SPECIES OF DESELVANA

[*Type not seen. †Known only from female.
§Known only from type (without abdomen).]

†*castanoptera* (Melichar), 1925a:348 (*Teletusa*). SE. Brazil. New combination.

dorsivitta (Walker), 1851b:802 (*Ciccus*). Fr. Guiana, D. Guiana, N. Brazil. New combination.

castanea (Melichar), 1925a:348 (*Teletusa*). New synonymy.

**excavata* (Le Peletier and Serville), 1825a:611 (*Proconia*). [Melichar's (1925a) interpretation followed here.] SE. Brazil. New combination.

rufifacies (Walker), 1851b:802 (*Ciccus*).

cinctipes (Walker), 1851b:803 (*Ciccus*).

intermedius (Walker), 1851b:803 (*Ciccus*).

excavata var. *atra* (Melichar), 1925a:345 (*Teletusa*).

†*ezba* (Distant), 1908b:69 (*Amblydisca*). Ecuador. New combination.

†*falleni* (Stål), 1858f:249 (*Tettigonia*). SE. Brazil. New combination.

**fulvofasciata* (Gray), 1832a:223 (*Cicada*). Locality? New combination.

§*insignior* (Fowler), 1899a:220 (*Aulacizes*). Panama. New combination.

longipennis (Melichar), 1925a:347 (*Teletusa*). Peru. New combination.

**ornata* (Blanchard), 1840a:193 (*Tettigonia*). [Signoret's (1855c:519) interpretation followed here.] SE. Brazil. New combination.

†*testacea* (Walker), 1851b:800 (*Ciccus*).

punctosus (Walker), 1858b:246 (*Ciccus*). New synonymy.

**pervirgata* (Amyot and Serville), 1843a:573 (*Ciccus*). [Melichar's (1925a) interpretation followed here.] SE. Brazil. New combination.

†*simulans* (Schmidt), 1928c:65 (*Teletusa*). Colombia. New combination.

34. Genus OMAGUA Melichar

FIGURE 147

Omagua Melichar, 1925a:350. Type-species: *Tettigonia fitchi* Signoret (1855b: 230), by original designation and monotypy.

Length 17 mm.

Head with median length about equal to intercocular width, anterior margin very slightly elevated and carinate, ocelli each about equidistant between adjacent anterior eye angle and median line of crown, without a distinct M-shaped elevation bordering posterior margin, with a median full-length fovea which is slightly broadened anteriorly, disc without setae; antennal ledges in lateral aspect without a longitudinal sulcus; clypeus depressed medially; clypellus not produced, its contour continuing profile of clypeus; other head characters as in *Abana*.

FIGURE 147.—*Omagua fitchi* (Signoret): a, i, specimen from French Guiana; others from specimen from "Amazonas."

Thorax with pronotal width less than transocular width of head, lateral margins parallel, disc punctate, without conspicuous pubescence; scutellum obscurely striate in posterior half; otherwise as in *Abana*. Forewing with membrane including all of apical cells, clavus incompletely punctate, with more than four apical cells, the base of the fourth slightly more distal than base of third, otherwise as in *Abana*. Hindwing as in *Abana*. Hindlegs with femoral setal formula 2:0:0; otherwise as in *Abana*.

Male genitalia: Pygofer with a dorsal projection near midlength of dorsal margin, with a number of small macrosetae extending from base of plate to pygofer apex, without processes. Plates separate throughout their length, extending as far posteriorly as pygofer apex, triangular, with a number of small macrosetae on disc and a number of microsetae laterad of these. Style extending farther posteriorly than apex of connective, with distinct preapical lobe, apex somewhat foot-shaped with the toe directed mesally, with a few lateral anteapical microsetae. Connective Y-shaped, with arms not widely divergent, stem expanded at apex. Aedeagus symmetrical, with a pair of elongate conspicuous dorsal processes between which is an unpaired process, gonopore very large. Paraphyses elongate, slender, symmetrical.

Female abdominal sternum VII abruptly narrowed near midlength and produced in a quadrate process which is trilobed at its apex.

This genus is known only from the type-species, which is very rare in collections. Specimens have been examined from French and British Guiana and "Amazonas." *Omagua* is related to *Deselvana*, new genus, from which it differs in its less produced head and its shorter aedeagal shaft with the very large gonopore.

35. *Genus* RHAPHIRRHINUS Laporte

FIGURE 148

Rhaphirhinus Laporte, 1832d:413. Type-species: *Fulgora adscendens* Fabricius, which is a junior synonym of [*Cicada*] *phosphorea* Linnaeus, by original designation.

Rhaphidorhinus Stål, 1869a:62 (invalid emendation).

Length 12–17 mm. not including process of head.

Head strongly produced, median length (without process) exceeding transocular width, gradually or abruptly narrowed apically and with a slender, elongate, curved apical process extending anteriorly and dorsally, disc with a narrow full-length median fovea; antennal ledges with a longitudinal fovea, in lateral aspect carinate dorsally; clypeus convex except for slight concavity below base of process, muscle impressions not conspicuous; otherwise as in *Deselvana*, new genus.

Thorax with pronotal width equal to or less than transocular width of head, lateral margins subparallel, disc coarsely punctate except submarginal area near anterior margin; scutellum not, or obscurely, transversely striate on posterior half, otherwise as in *Deselvana*. Forewing with membrane including nearly all of apical cells in non-teneral specimens, veins distinct, clavus densely, corium sparsely punctate, with four apical cells, the relative position of bases of third and fourth apical cells variable, otherwise as in *Deselvana*. Hindwing as in *Deselvana*. Front legs with tibiae slightly expanded and flattened apically. Hindlegs as in *Deselvana*.

Male genitalia: Pygofer and plates as in *Deselvana*, but with macrosetae occasionally abundant, occasionally with only a few microsetae, and with plates distinctly shorter than pygofer. Other genital characters much as in *Deselvana*.

Female abdominal sternum VII strongly produced, with lateral margins convergent apically and apical margin weakly trilobate.

Melichar and others have distinguished species of *Rhaphirrhinus* primarily on the basis of color. I have found all sorts of variation and intergradation in color and some variation in size, but with no supporting morphological characters, these being also somewhat variable. The genus is considered to include only a single species. *Rhaphirrhinus* is closely related to *Deselvana* but differs in its conspicuous head process.

A specimen without abdomen in the Moravian Museum in Brno is here designated lectotype of *Rhaphirrhinus vagatus* Melichar. It bears the following labels: "Museum Paris/Trinidad/Santa-Anna/Bourgoin 1901" and "vagatus M./det. Melichar." and "Collectio/Dr. L. Melichar/Moravske museum Brno" and "Raphirhinus/vagatus/det. Melichar."

SPECIES OF RHAPHIRRHINUS

[*Type not seen.]

**phosphoreus* (Linnaeus), 1758a:434 (*Cicada*). Ecuador to Bolivia and eastward to Trinidad Is., the Guianas, and Brazil.
**filirostris* (De Geer), 1773a:201 (*Cicada*).
adscendens (Fabricius), 1787a:260 (*Fulgora*).
fasciatus (Fabricius), 1787a:261 (*Fulgora*). New synonymy.
**acuminata* (Olivier), 1791a:571 (*Fulgora*).
**flammea* (Olivier), 1791a:570 (*Tettigonia*). New synonymy.
**cupriventris* (Laporte), 1832d:414 (*Tettigonia*).
**obliquatus* Laporte, 1832d:415.
angustus Walker, 1851b:806.
fabricii (Signoret), 1855c:521 (*Tettigonia*). New synonymy.
**rugosa* (Signoret), 1855c:522 (*Tettigonia*). New synonymy.
subulatus Melichar, 1925a:355. New synonymy.
vagatus Melichar, 1925a:355. New synonymy.

FIGURE 148.—*Rhaphirrhinus phosphoreus* (Linnaeus) (**i** from specimen from Peru, others from Bolivian specimens, plate not shown in **c**): **j**, female abdominal sternum VII; **k**, aedeagus and paraphyses in lateral view; **m**, forewing; **n**, hindwing.

36. Genus ACROBELUS Stål

FIGURES 149, 150

Acrobelus Stål, 1869a:60. Type-species: *Tettigonia reflexus* Signoret, new name (=*Rhaphirrhinus attenuatus* Walker), by monotypy.

Length of male 14–16 mm.

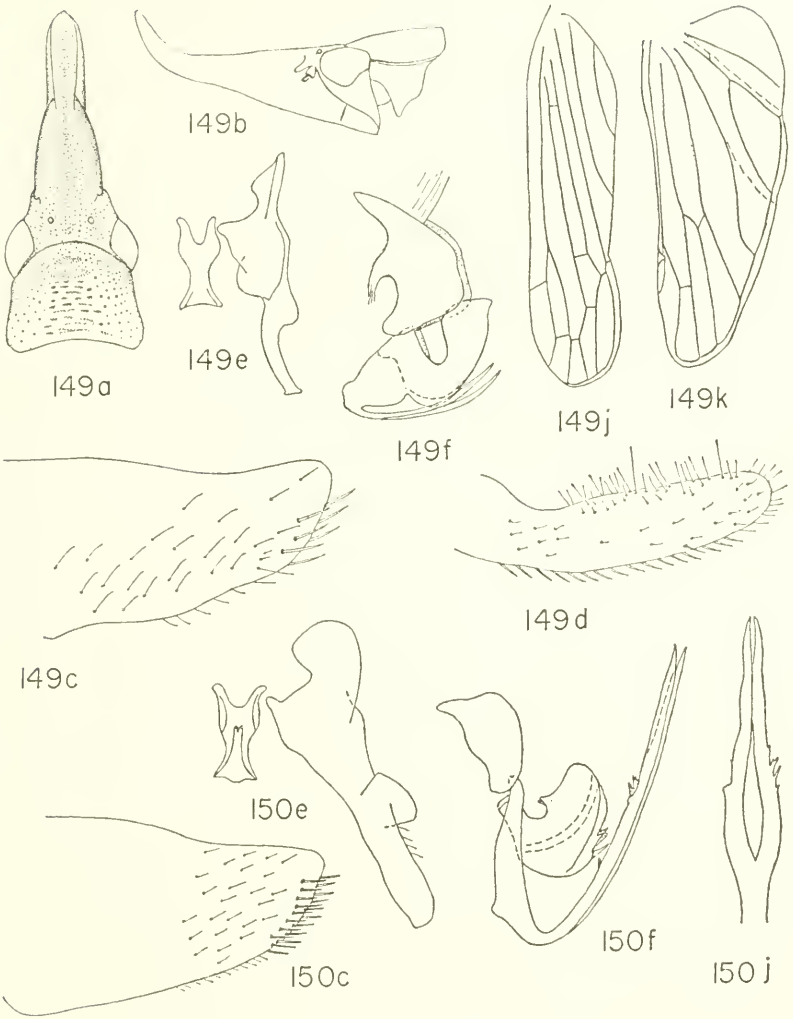
Head elongate and triangular, the apex produced into a rather broad process which is directed dorsally and anteriorly, median length including process much greater than transocular width, with a narrow median fovea extending full length of crown and process; antennal ledges in lateral aspect each with a longitudinal fovea, anterior margin steeply declivous; clypeus convex except apically, where it is concave on lower portion of process, muscle impressions indistinct but their locations marked by transverse groups of fine setae; other characters as in *Deselvana*.

Thorax with pronotal disc punctate except narrow anterior submarginal portion, with short setae, scutellum indistinctly transversely striate on posterior half; otherwise as in *Deselvana*. Forewing with membrane including only inner apical cell, veins distinct, not elevated, texture coriaceous, with at least the clavus punctate, with four apical cells, the relative position of bases of third and fourth variable, without an anteapical plexus on corium, without or with only one or two anteapical veins to costal margin. Hindwing as in *Deselvana*. Hindlegs with femoral setal formula 2:1:0; first tarsomere with length less than combined length of second and third.

Male genitalia: Pygofer well produced, the apex broadly rounded, with a few microsetae dispersed generally over disc, or limited to anteapical region, with a group of submarginal and marginal apical macrosetae, without processes. Plates not fused, extending as far posteriorly as apex of pygofer, slender and elongate, rounded apically, each with a number of dispersed microsetae. Style extending posteriorly much further than apex of connective, with distinct preapical lobe, truncate or not at apex. Connective short, Y-shaped, with a slight median keel. Aedeagus symmetrical, shaft short, curved strongly posteriorly and dorsally, with or without processes. Paraphyses present, paired, closely associated with base of aedeagus, with length variable interspecifically.

Female abdominal sternum VII not strongly produced, posterior margin almost rectilinear, slightly concave on both sides of middle (female of *A. reflexus* (Signoret) unknown).

Specimens of *Acrobelus* are not very common in collections. The genus is known from central and northern South America; the type species has been seen from Costa Rica and Panama. *Acrobelus* resembles *Rhaphirrhinus* in the aedeagal structure, in the produced head, and in a number



FIGURES 149, 150.—**149**, *Acrobelus reflexus* (Signoret), specimen from Barro Colorado Island, Panama (plate not shown in **c**, lateral view shown in **d**, processes of anal tube shown in **f**): **j**, forewing; **k**, hindwing. **150**, *A. ecuadorianus*, new species, holotype (plate not shown in **c**, process of anal tube shown in **f**): **j**, paraphyses, apical portion in caudoventral view.

of other characters. It differs in its broader apical head process, its less tapered male pygofer in lateral aspect, its stalked paraphyses, and in that the apices of the anterior tibiae are not expanded and flattened apically.

The genitalia of the male holotype of *Acrobelus attenuatus* (Walker) agree well with figure 149.

SPECIES OF ACROBELUS

ecuadorianus, new species. Ecuador.
reflexus (Signoret), 1855c:524 (*Tettigonia*) [new name]. Costa Rica.
attenuatus (Walker), 1851b:806 (*Rhaphirrhinus*), preoccupied.

KEY TO SPECIES OF ACROBELUS

Paraphyses not attaining aedeagal apex, aedeagus without processes, crown in dorsal aspect compressed at base of apical process.
A. reflexus (Signoret) (fig. 149)
Paraphyses exceeding aedeagal apex, aedeagus with short dorsal and ventral processes, crown in dorsal aspect not compressed at base of apical process. . . . . A. ecuadorianus, new species

Acrobelus ecuadorianus, *new species*

FIGURE 150

Length 16 mm. Head with median fovea narrow, of uniform width throughout length. Forewing with pubescence longer and more irregular than in *A. reflexus* (Signoret), corium punctate only near humeral margin. Male style with slight median apical projection; aedeagus with small dorsal and ventral processes near midlength of shaft; paraphyses greatly exceeding apex of shaft, with asymmetrical short processes. Other characters as in generic description.

Holotype male with labels: "Ecuador" and "North'd" in USNM, and one female, Abitagua, Ecuador, May 28 (NCS).

The species is closely related to *A. reflexus* (Signoret), but differs in the characters set forth in the key and in the description.

37. *Genus* TELETUSA Distant

FIGURE 151

Teletusa Distant, 1908b:78. Type-species: *T. paraguayensis* Distant, by original designation.
Myogonia Melichar, 1926a:332. Type-species: *Tettigonia limpida* Signoret, by original designation. New synonymy.

Length 9.5–11.5 mm.

Head with crown slightly produced, median length less than interocular width, anterior margin rounded to face except at middle, where there is a slight carina, ocelli much closer to posterior margin than to apex, located behind a line between anterior eye angles, about midway between latter and median line, with an M-shaped elevation bordering posterior margin, with a full-length broad median fovea, without a longitudinal carina laterad of each ocellus, with muscle impressions forming a dorsal tuberosity on each side of apex, surface with elongate, fine setae, lateral clypeal sutures extending onto crown and attaining

ocelli; antennal ledges protuberant, each with a longitudinal fovea in dorsal aspect, in lateral aspect with dorsal margins carinate, anterior margins steeply declivous; clypeus slightly depressed medially, muscle impressions distinct; transclypeal suture concealed; face thickly beset with dense long pubescence beneath; entire clypellus at right angle to contour of clypeus.

Thorax with pronotal width less than transocular width of head, lateral margins subparallel, surface rugose and punctate, pubescent, posterior margin concave, with complete dorsopleural biundulate carinae; posterior half of scutellum with a dense area of erect pubescense. Forewing hyaline, veins distinct, usually with a smoky area at base of anteapical cells, and occasionally with additional smoky subhyaline areas, venation as in *Rhaphirrhinus* (p. 157), wings of female at rest extending farther posteriorly than apex of ovipositor. Hindwing at rest extending posteriorly only to bases of apical cells of forewing, with vein R_{2+3} incomplete. Forelegs with tibiae expanded and flattened apically. Hindlegs at rest with knees not attaining posterior proepimeral margins; setal formula 2:0:0; first tarsomere shorter than combined length of second and third. Abdomen in dorsal aspect short, broad, slightly flattened in both sexes, its lateral areas visible in dorsal aspect at sides of wings at rest.

Male genitalia: Pygofer very slightly produced posteriorly, posterior margin rounded or slightly concave, with dispersed microsetae on posterior half, without processes; ninth tergum not separated from sternum by a suture. Plates separate throughout their length, triangular with apices broadly rounded, with numerous dispersed microsetae. Style extending as far posteriorly as apex of connective, with preapical lobe, apex foot-shaped, with few serially-arranged lateral microsetae behind preapical lobe. Connective Y-shaped with arms shorter than stem which is not carinate. Aedeagus symmetrical, much as in *Rhaphirrhinus*, with a laterotergite on each side above dorsal apodeme, without processes. Paraphyses reduced to a single small sclerite between connective and base of aedeagus (not shown in illustrations).

Female abdominal sternum VII narrow, posterior margin sinuate on each side of median produced rounded lobe.

In this genus the male genitalia and the venation of both pairs of wings are similar to *Rhaphirrhinus*. *Teletusa* stands well apart from other genera in this tribe in its very pubescent scutellum and lower portion of the face, in the very short pygofer of the male, and in the broad, flattened, short abdomen.

I have been unable to find specific characters for the nominal species provisionally considered here as a single species. Specimens have been examined from Amazonas to Bolivia and to Paraguay and Argentina.

Although I have not seen the type specimen of the type-species, there is no doubt, from the original illustration, that the species is correctly placed in *Teletusa*.

SPECIES OF TELETUSA

[*Type not seen.]

**limpida* (Signoret), 1855c:512 (*Tettigonia*). Amazonas in Brazil to Bolivia and to Paraguay and Argentina. New combination.

nigra (Signoret), 1855c:513 (*Tettigonia*). New synonymy.

paraguayensis Distant, 1908b:78. New synonymy.

peruviensis Distant, 1908b:79. New synonymy.

neotropicalis Distant, 1908b:79. New synonymy.

hyalina (Schmidt), 1928a:54 (*Myogonia*). New synonymy.

holzfussi (Schmidt), 1931b:76 (*Myogonia*). New synonymy.

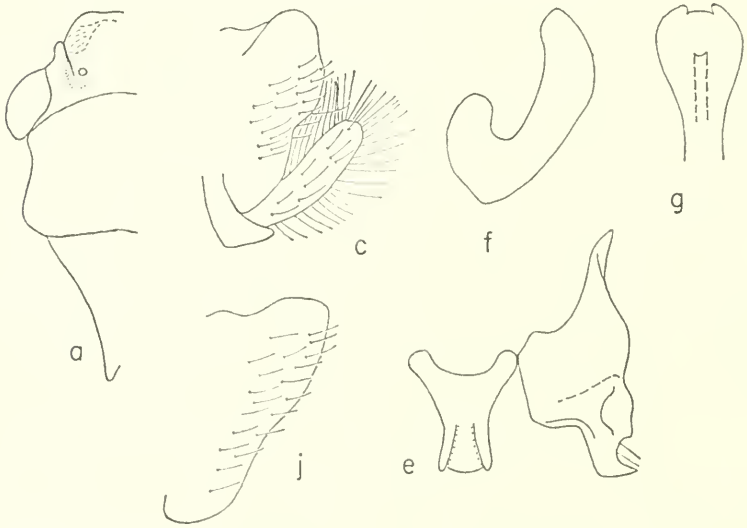


FIGURE 151.—*Teletusa limpida* (Signoret), specimen from Misiones, Argentina, except **j**, which is from Tingo María, Peru. Background in **a** is entirely black, except shaded area, which is orange.

38. DESAMERA, *new genus*

FIGURE 152

Type-species: *Cicada intersecta* Germar.

Length 14–17 mm.

Head triangular, well produced, median length greater than interocular width, with a weak longitudinal keel laterad of each ocellus, surface of crown finely pubescent, antennal ledges foveate, other head characters as in *Ciccus* (p. 80).

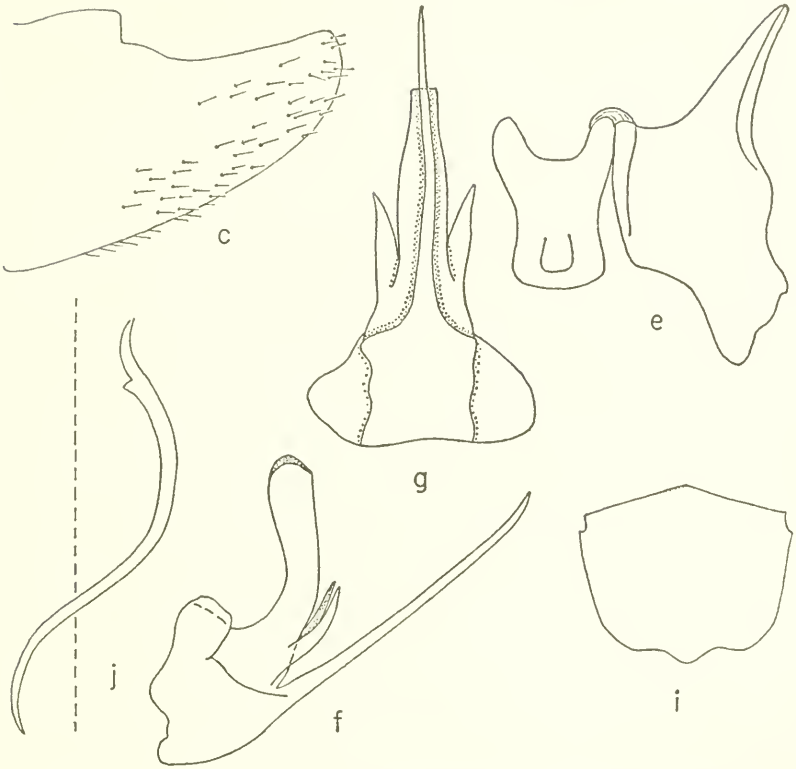


FIGURE 152.—*Desamera intersecta* (Germar), specimen from Bolivia, except **i**, which is from lectotype of *D. adspersa peruviana* (Melichar): **j**, right process of conjunctiva IX–X.

Thorax as in *Ciccus*. Forewing without a membrane, veins elevated and distinct, clavus and corium coriaceous, with only four apical cells and base of fourth located proximal to base of the third, usually without anteapical supernumerary veins to costal margin, other characters as in *Ciccus*. Hindwing with vein R_{2+3} incomplete, otherwise as in *Ciccus*. Hindlegs as in *Ciccus*.

Male genitalia: Pygofer in lateral aspect produced, apex slightly concave to slightly convex, with microsetae evenly distributed over apical portion of disc, processes from posterior membrane as in *Ciccus* but much longer. Plates separate throughout length, in dried specimens partially enclosed by lower margins of pygofer, not attaining pygofer apex, triangular and narrowly rounded apically, with numerous evenly dispersed microsetae. Style extending farther posteriorly than apex of connective, without preapical lobe, apex broadly and obliquely

truncate. Connective short, Y-shaped, stem very short, without a median keel. Aedeagus symmetrical, curved gradually posteriorly and dorsally, with a pair of short processes beyond base of shaft and a single median unpaired process which greatly exceeds apex of shaft. Paraphyses absent (see description of processes from posterior membrane, above).

Female abdominal sternum VII with posterior margin biundulate each side of a median projection which is more prominent than in *Ciccus*.

The genus is known only from the type-species. *Desamera* is closely related to *Ciccus* and to *Procandea* (p. 69), differing conspicuously in that the posterior meron is exposed, a condition believed to have arisen adventitiously in *Desamera*.

SPECIES OF DESAMERA

[*Type not seen.]

**intersecta* (Germar), 1821a:60 (*Cicada*). Peru, S. and SE. Brazil. New combination.

adspersa var. *peruviana* (Melichar), 1926a:285 (*Coelopola*). New synonymy.

39. *Genus* TRETOGONIA Melichar

FIGURES 153–162

Tretogonia Melichar, 1926a:273. Type-species: *Tettigonia pruinosa* Walker, preoccupied, = *Tretogonia notatifrons* Melichar, by original designation.

Length 10–12 mm.

Head not strongly produced, anterior margin regularly convex or truncate apically in dorsal aspect, crown rounded to face anteriorly, ocelli much closer to posterior margin than to apex, located on or slightly behind a line between anterior angles of eyes, each usually slightly closer to median line than to adjacent anterior eye angle, disc of crown without median fovea or longitudinal carina laterad of each ocellus, without an M-shaped elevation bordering posterior margin, not pubescent, lateral clypeal sutures extending onto crown (often obscured by pruinosity) and attaining ocelli; antennal ledges not or scarcely protuberant, longitudinally foveate in dorsal aspect, in lateral aspect with a dorsal carina, anterior edges sloping gradually; clypeus flattened medially, muscle impressions distinct; transclypeal suture obsolete; face finely pubescent; clypellus slightly protuberant, contour of its lower portion not continuing profile of clypeus.

Thorax with pronotal width less than transocular width of head; lateral margins parallel, disc with numerous large deep pits, without conspicuous pubescence, posterior margin nearly always strongly convex, extending much farther posteriorly than usual in the tribe,

usually attaining or exceeding transverse sulcus of scutellum; scutellum transversely striate behind transverse sulcus. Forewing with membrane including apical cells and apical portions of anteapical cells, veins usually obscured before membrane, texture of clavus and corium strongly coriaceous and conspicuously pitted, with four apical cells, base of fourth more proximal than base of third, claval veins parallel, the inner often obscure, without an anteapical plexus of veins and without supernumerary veins to costa, wings at rest concealing ovipositor. Hindwing at rest extending almost as far posteriorly as apex of forewing; vein R_{2+3} incomplete. Hindlegs at rest with knees not attaining posterior proepimeral margins; setal formula 2:1:1 or 2:1:0, rarely 2:1:1:1; first tarsomere with length equal to or greater than second plus third.

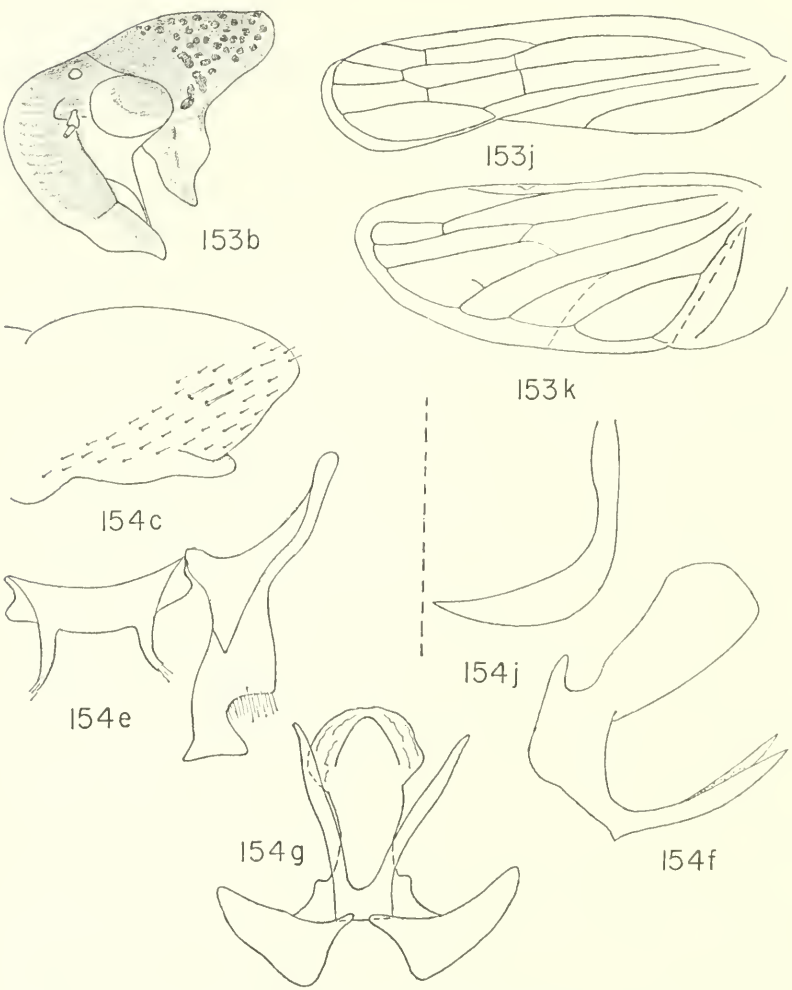
Male genitalia: Pygofer moderately produced, rounded or angulate at apex, with setal pattern variable interspecifically, often with several macrosetae interspersed among the microsetae, with a process arising on each side on ventral margin before apex. Plates separate throughout their length, length in relation to pygofer apex variable interspecifically, triangular, with numerous dispersed microsetae and a few interspersed macrosetae. Style extending farther posteriorly than apex of connective, with preapical lobe, apex variable interspecifically. Connective papilioniform or Y-shaped, the arms widely divergent, keeled medially or not. Aedeagus symmetrical, shaft stout, processes absent or present and variable interspecifically. Paraphyses absent.

Female abdominal sternum VII with posterior margin usually shallowly emarginate and with a slight median lobe within the emargination.

Species of *Tretogonia* are drab, brownish to fuscous in color, frequently strongly pruinose. The presence of a yellow spot on the face is variable within some species, possibly constant in others. The sclerites of the membrane of the female genital chamber may be found eventually to be characters of specific value. Specimens belonging to this genus have been studied from the region from Panama to Argentina.

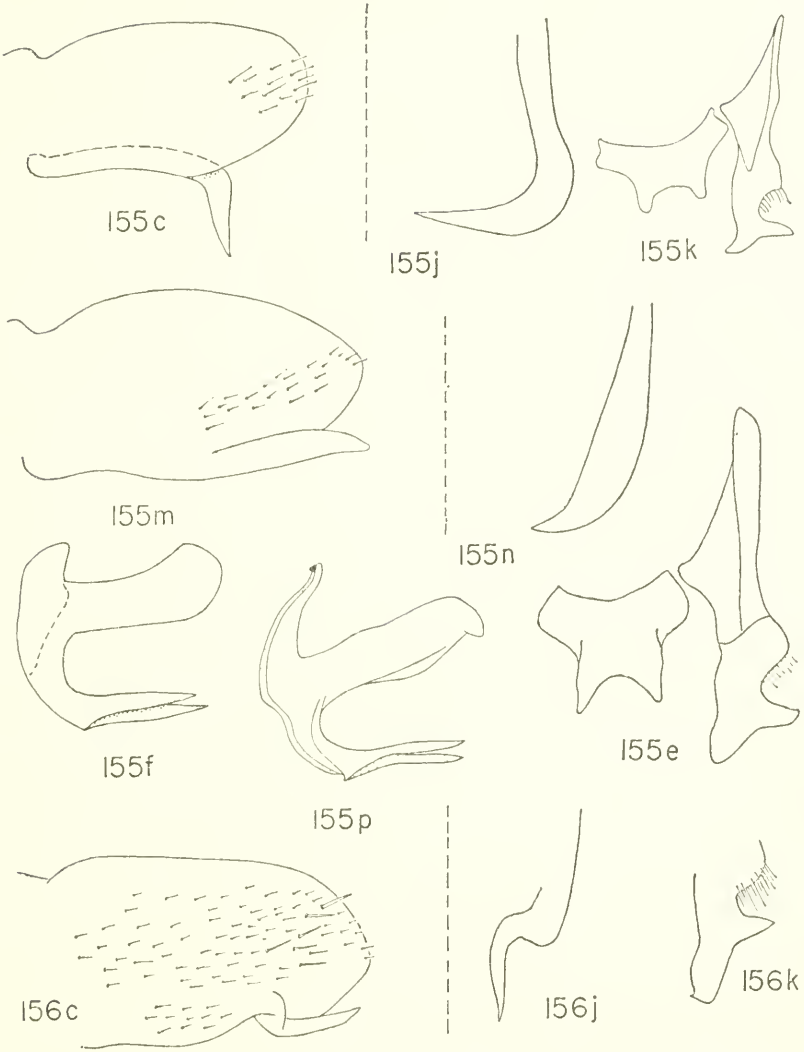
The present interpretation of *T. pruinosa* (Walker) is based on a male specimen from the collection of Carlos Berg and determined by Berg. The abdomen is missing from Walker's holotype in the British Museum (Natural History). *T. tomentosa* (Distant) is not illustrated here; the genitalia of a male topotype compared with the lectotype are like *T. punctatissima* Melichar except the style apices, which are like those of *T. notatifrons* Melichar, and the pygofer processes in ventral aspect, which are like *T. costalimai*, new species.

The holotype of *T. lateritia* (Taschenberg) is a female and very close to *T. cribrata* Melichar, perhaps synonymous with the latter. The male

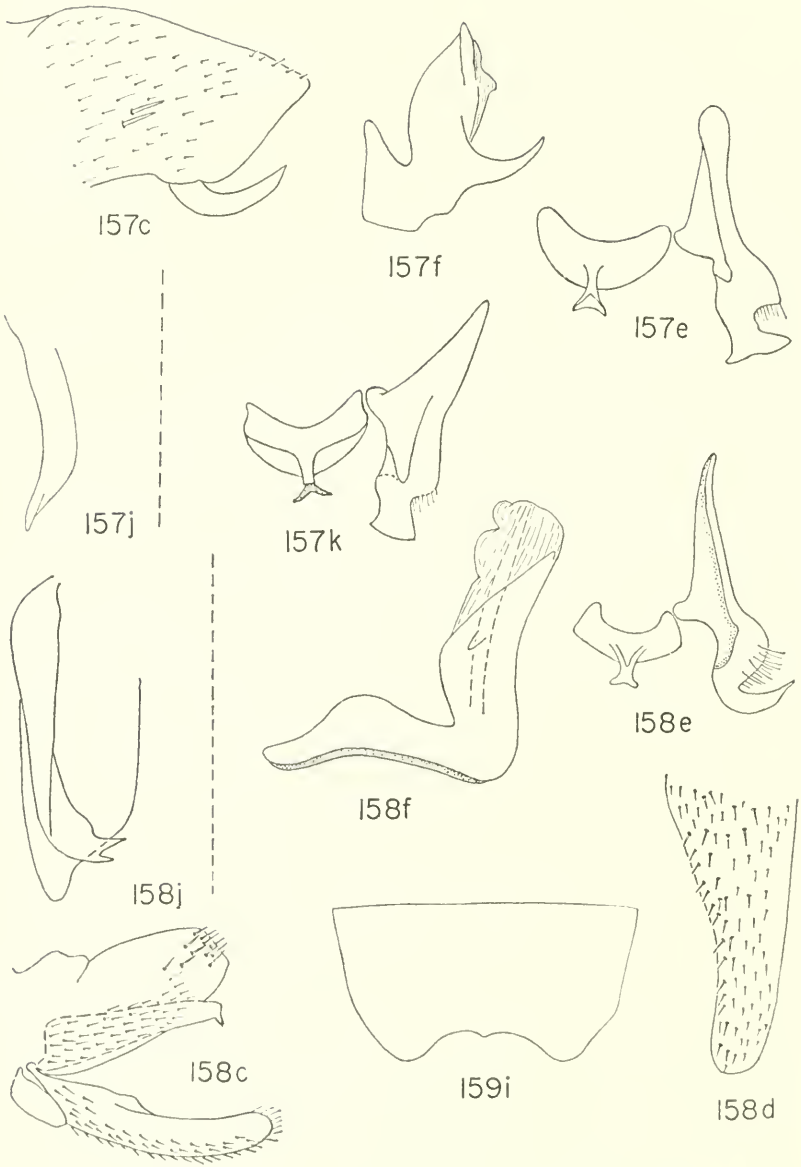


FIGURES 153, 154.—**153,** *Tretogonia* spp. (**b** from Bolivian specimen, size of pronotal pits exaggerated): **j** and **k**, fore- and hindwing, specimen from Santarém, Brazil. **154,** *T. callifera* Melichar, specimen from Bolivia (plate not shown in **c**): **j**, left pygofer process, ventral aspect.

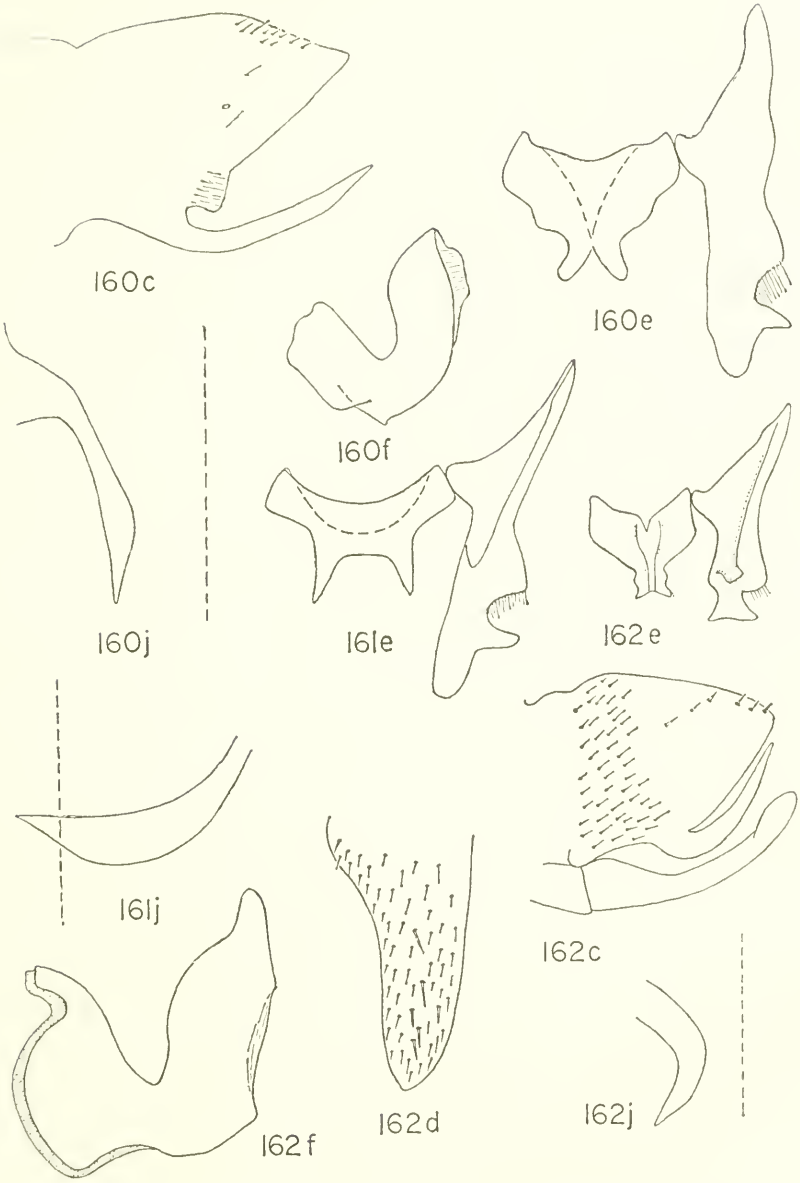
genitalia of the lectotype of *T. cribrata* agree with figure 155j, k, and p. The male genitalia of the lectotype of *T. callifera* Melichar agree well with figure 154. The male genitalia of the lectotype of *T. punctatissima* Melichar agree well with figure 160, as do the genitalia of the lectotype of *T. producta* Schmidt, the latter differing only in minor details. The male genitalia of *T. notatifrons* Melichar agree with figure 161.



FIGURES 155, 156.—**155,** *Tretogonia cribrata* Melichar (**c, e, f, j** from specimen from Pernambuco Prov., Brazil (plate not shown in **c**); **k** and **p**, from unknown locality; **m** and **n**, from Tingo María, Peru): **j, n,** left pygofer process, ventral view; **p,** aedeagus, lateral view; **m,** pygofer, lateral view. **156,** *T. bergi*, new species, specimen from Coralito, Uruguay (plate not shown in **c**): **j,** left pygofer process, ventral view; **k,** style apex.



FIGURES 157–159.—**157,** *Tretogonia conspersa* Schmidt (**c** and **k** from specimen from Panama, plate not shown in **c**; others, from Río Orinoco): **j,** right pygofer process, ventral view; **k,** style and connective, dorsal view. **158,** *T. cinerea* (Osborn), paratype: **j,** pygofer, right side, ventral view. **159,** *T. conspicua* Melichar, lectotype.



FIGURES 160–162.—**160,** *Tretogonia punctatissima* Melichar, specimen from Paramba, Ecuador (plate not shown in **c**): **j,** right pygofer process, ventral view. **161,** *T. notatifrons* Melichar, specimen from Rosario, Lake Bogagua, Bolivia: **j,** left pygofer process, ventral view. **162,** *T. costalimai*, new species, holotype: **j,** right pygofer process, ventral view.

SPECIES OF TRETOGONIA

[†Known only from female.]

†*albicans* (Walker), 1858b:214 (*Tettigonia*). E. Brazil. New combination.
bergi, new species. SE. Brazil, Uruguay, Paraguay, Argentina.
callifera Melichar, 1926a:275. Fr. Guiana, D. Guiana, N. and NE. Brazil, Peru, Bolivia.
cinerea (Osborn), 1926b:164 (*Amblydisca*). N. Brazil, Bolivia. New combination.
conspersa Schmidt, 1928a:43. Panama, Colombia, Venezuela, Br. Guiana.
†*conspicua* Melichar, 1926a:275. Ecuador.
costalimai, new species. Br. Guiana.
cribrata Melichar, 1926a:275. N., NE., SE. Brazil, Fr. Guiana, Peru, Bolivia.
†*lateritia* (Taschenberg), 1884a:443 (*Tettigonia*). N. Brazil. New combination.
notatifrons Melichar, 1926a:274. Fr. and D. Guiana, E. and S. Brazil, Ecuador, Bolivia, Paraguay, Argentina.
pruinosa (Walker), 1851b:755 (*Tettigonia*), preoccupied.
walkeri Metcalf, 1965a:599, new name for *Tettigonia pruinosa* Walker. New synonymy.
punctatissima Melichar, 1926a:275. Colombia, Venezuela, Ecuador, Peru.
producta Schmidt, 1928a:43. New synonymy.
tomentosa (Distant), 1908b:67 (*Oncometopia*). Ecuador. New combination.

KEY TO MALES OF TRETOGONIA

Not included: *albicans* (Walker), *conspicua* Melichar, and *lateritia* (Taschenberg).

1. Aedeagus with paired elongate processes arising from base . . 2
   Aedeagus with unpaired ventral process, or with very short processes located distad of base, or without processes. 5
2. Pygofer process curved strongly mesally at base in ventral aspect, the two processes subparallel apically (fig. 156).
   T. bergi, new species (p. 173)
   Pygofer process not so. 3
3. Style with mesoapical process digitiform.
   T. notatifrons Melichar (fig. 161)
   Style with mesoapical process acute. 4
4. Style truncate apically, or only slightly concave.
   T. callifera Melichar (fig. 154)
   Style distinctly concave at apex . . T. cribrata Melichar (fig. 155)
5. Aedeagus with a conspicuous ventral unpaired process arising near base. . . . . T. conspersa Schmidt (fig. 157)
   Aedeagus without such a process. 6
6. Pygofer processes bifid apically; aedeagal shaft with a pair of minute lateral processes. . . . . T. cinerea (Osborn) (fig. 158)
   Pygofer processes not bifid apically; aedeagal shaft without processes. 7

7. Pygofer processes strongly hooked in caudoventral aspect. . . . 8
   Pygofer processes not so. . . T. punctatissima Melichar (fig. 160)
8. Style with mesoapical lobe angular. T. costalimai, new species
   Style with mesoapical lobe digitiform. . . T. tomentosa (Distant)

Tretogonia bergi, *new species*

FIGURE 156

Length of male 10.5–11 mm.; of female 11.5 mm. Pronotum not extending posteriorly as far as transverse sulcus of scutellum, truncate or slightly concave at apex. Forewing with claval veins usually elevated and distinct, veins of corium obscured except in membrane. Male pygofer strongly produced and rounded apically, with numerous dispersed microsetae over disc, with a few interspersed anteapical macrosetae; process in ventral aspect tapered and bisinuate, acute apically; plates not extending as far posteriorly as pygofer.

Holotype male and a long series of topotypes, Pelotas, Rio Grande do Sul, Sept. 1, 1955 (C. Biezanko), in SSM; a short series of topotypes (BM); two specimens, São Leopoldo (RMS); specimens from Rio Grande do Sul, Brazil, from Paraguay, and from Formosa, Argentina (HNHM); specimens from Coralito, Uruguay, Montevideo, Argentina and Pelotas, Brazil (USNM); specimens from Porto Alegre, Brazil (ZIMH); specimens from Rio Grande do Sul (MHNP).

T. bergi is readily distinguished from other species of *Tretogonia* by the form of the pygofer process in ventral aspect.

Tretogonia costalimai, *new species*

FIGURE 162

Length 10 mm. Head with anterior margin regularly convex in dorsal aspect. Pronotum extending posteriorly to transverse sulcus of scutellum. Forewing with inner claval vein distinct or not, veins of corium distinct before membrane. Male pygofer produced and subangular at apex, process in ventral aspect with apex curved laterad; plates extending as far posteriorly as apex of pygofer, otherwise as in *T. bergi*, new species; style truncate and slightly concave apically; connective Y-shaped, with a median keel; aedeagus without processes. Other structural characters as in generic description. Color much as *T. bergi* but without yellow spot on face.

Holotype male, Rupununi, British Guiana, June 1933 (Scaramuzza), on indefinite loan to USNM from NCS; and a pair of additional specimens, same data (NCS).

This species is closely related to *T. punctatissima* Melichar, from which it can be separated by its truncate style apices and its more strongly curved pygofer processes in ventral aspect.

40. Genus CYRTODISCA Stål

FIGURE 163

Cyrtodisca Stål, 1869a:60. Type-species: *Tettigonia major* Signoret, by monotypy.

Length 17–20 mm.

Head moderately produced, broad, median length less than interocular width, crown rounded to face, not carinate apically, ocelli located on a line between anterior angles of eyes, each about equidistant between adjacent eye angle and median line, disc with median line impressed, not foveate, with a short longitudinal carina laterad of each ocellus, with a slight M-shaped elevation bordering posterior margin, without setae; antennal ledges distinctly foveate, each with a dorsal carina in lateral aspect, and with anterior margin steeply declivous; clypeus slightly flattened medially, muscle impressions distinct; transclypeal suture obsolete; face finely pubescent below; clypellus with contour continuing profile of clypeus.

Thorax with pronotal width less than transocular width of head, lateral margins parallel, disc strongly punctate and rugose on posterior two-thirds, without pubescence, posterior margin concave, in lateral aspect with a complete, slightly oblique dorsopleural carina which is curved slightly ventrally near its anterior end; scutellum transversely striate on posterior portion. Forewing with membrane including only inner apical cell, veins elevated and distinct, texture of clavus and corium strongly coriaceous, basal half of clavus punctate, apical cells variable, claval veins parallel, with an anteapical plexus of veins in corium and with or without anteapical supernumerary veins to costa near apex, wings of female at rest concealing ovipositor. Hindwing extending almost as far posteriorly as forewing; vein R_{2+3} entire. Hindlegs at rest with knees not attaining posterior proepimeral margins; femoral setal formula 2:0:0; first tarsomere with length exceeding combined length of second and third.

Male genitalia: Pygofer strongly produced and rounded apically, with numerous dispersed microsetae (occasionally with a few interspersed macrosetae), with a pair of processes arising on each ventral margin. Plates separate throughout their length, not extending as far posteriorly as pygofer apex, triangular, with numerous microsetae and interspersed macrosetae. Style extending posteriorly slightly farther than apex of connective, with an anteapical lobe, apex subtruncate. Connective Y-shaped, the arms widely divergent, stem short and strongly keeled. Aedeagus symmetrical, short, bulbous, curved abruptly dorsally in apical portion, without processes. Paraphyses absent.

Female abdominal sternum VII strongly produced, its posterior margin shallowly emarginate medially.

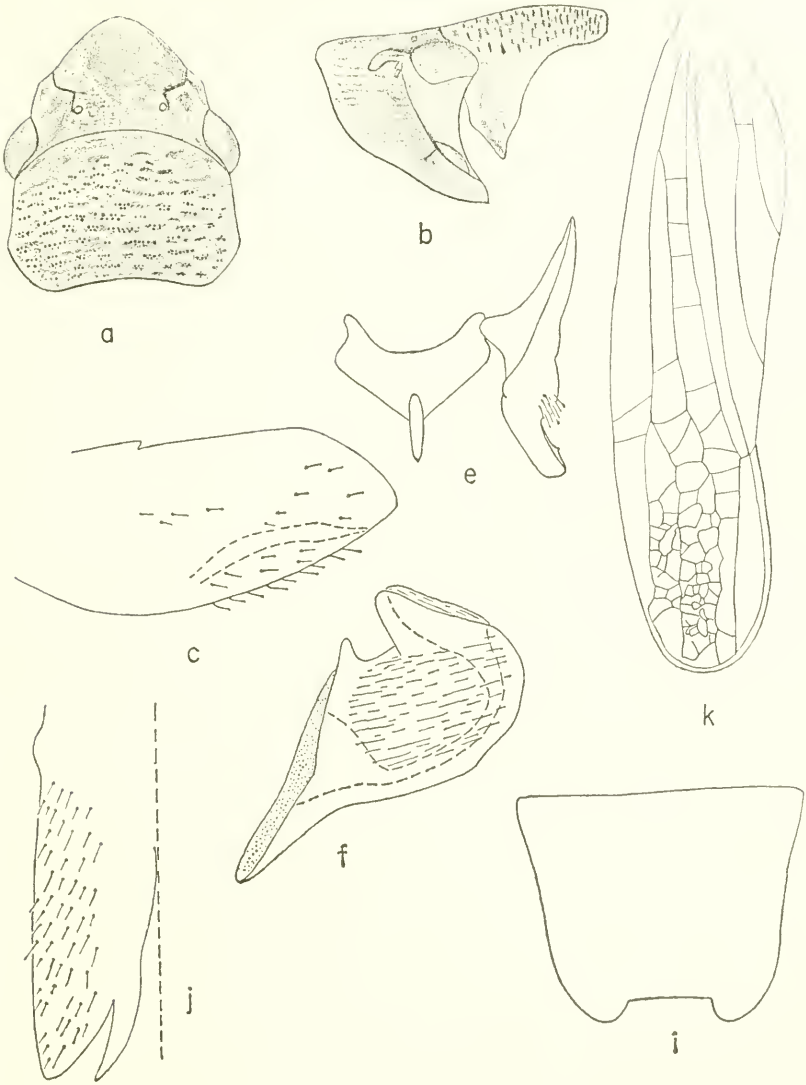


FIGURE 163.—*Cyrtodisca major* (Signoret), specimen from Cuernavaca, Mexico, except i, which is from Colima, Mexico (plate and some setae not shown in c): j, pygofer, right side, ventral view; k, forewing.

Cyrtodisca is known only from the type-species. The genitalia of the male lectotypes of the two varieties of *C. major* (Signoret) agree with figure 163. The present interpretation of the identity of *C. scissa* (Walker) is based on a gross examination of the male of the original pair of specimens in the British Museum.

SPECIES OF CYRTODISCA

major (Signoret), 1854c:491 (*Tettigonia*). Mexico, Guatemala, Honduras, Costa Rica, El Salvador, Nicaragua, Panama, Colombia.
scissa (Walker), 1858b:226 (*Proconia*).
major var. *nigromarginata* Melichar, 1925a:367.
major var. *rufa* Melichar, 1925a:368.

41. Genus EGIDEMIA China

FIGURES 164–170

Oncometopia subg. *Dichometopia* Melichar, 1925a:406. Preoccupied. Type-species: [*Tettigonia*] *anceps* Fowler, by original designation.
Egidemia China, 1927d:283, as new name for *Dichometopia* Melichar.
Neometopia Schröder, 1959a:44. Type-species: *Oncometopia fowleri* Distant by original designation. New synonymy.

Length 10.5–15.6 mm.

Head moderately produced, its median length varying from less than half to more than eight-tenths interocular width and from three-tenths to one-half transocular width, anterior margin broadly rounded or truncate in dorsal aspect, without carina at transition from crown to face, ocelli located on a line between anterior angles of eyes, each about equidistant between adjacent eye angle and median line of crown, crown without median fovea, without longitudinal keel laterad of each ocellus, with or without an M-shaped elevation bordering posterior margin, without pubescence, lateral clypeal sutures extending onto crown and attaining ocelli; antennal ledges protuberant in dorsal aspect, each with a longitudinal depression and carinate dorsally in lateral aspect, anterior margin usually steeply declivous, occasionally (*E. inflata*, new species, *E. fowleri* (Distant), *E. proxima* (Melichar)) with a shallow concavity; clypeus usually convex (exception: *E. anceps* (Fowler), *E. paranceps*, new species) its dorsomedian portion granulate; transclypeal suture almost always incomplete; face finely pubescent below; clypellus not produced, its contour continuing profile of clypeus.

Thorax with pronotal width less than transocular width of head, lateral margins parallel, surface rugose or rugose and punctate, disc without pubescence, posterior margin concave, in lateral aspect with a complete dorsopleural carina which is oblique posteriorly and arched slightly downward in anterior half; scutellum transversely striate in posterior portion. Forewing translucent or hyaline, occasionally with a sclerotized area along costa in region of anteapical cells, with four apical cells, the base of the fourth more proximal than base of third, claval veins fused through a considerable portion of their length, separate basally and apically, without an anteapical plexus of veins and without supernumerary anteapical crossveins to costal margin; wings of

female in rest position completely concealing ovipositor. Hindwing at rest extending almost as far posteriorly as forewing; vein R_{2+3} incomplete. Hindlegs at rest with knees not attaining posterior proepimeral margins; femoral setal formula usually 2:1:1:1, occasionally 2:1:1 or 2:2:1; first tarsomere with length equal to or less than combined length of second and third.

Male genitalia: Pygofer variable, from moderately to strongly produced, rarely attenuate, with numerous dispersed microsetae and occasionally with a few interspersed macrosetae, with or without processes which are posterodorsal, ventral, or posteroventral in origin when present. Plates separate throughout their length, not extending as far posteriorly as pygofer apex (exception: *E. inflata*, new species), triangular, with numerous dispersed microsetae and occasionally with interspersed macrosetae. Style extending farther posteriorly than apex of connective, without preapical lobe, rounded or acute at apex. Connective variable in shape, the arms not widely divergent, usually with a median keel. Aedeagus symmetrical (exception: *E. proxima* (Melichar)), with or without processes. Paraphyses absent.

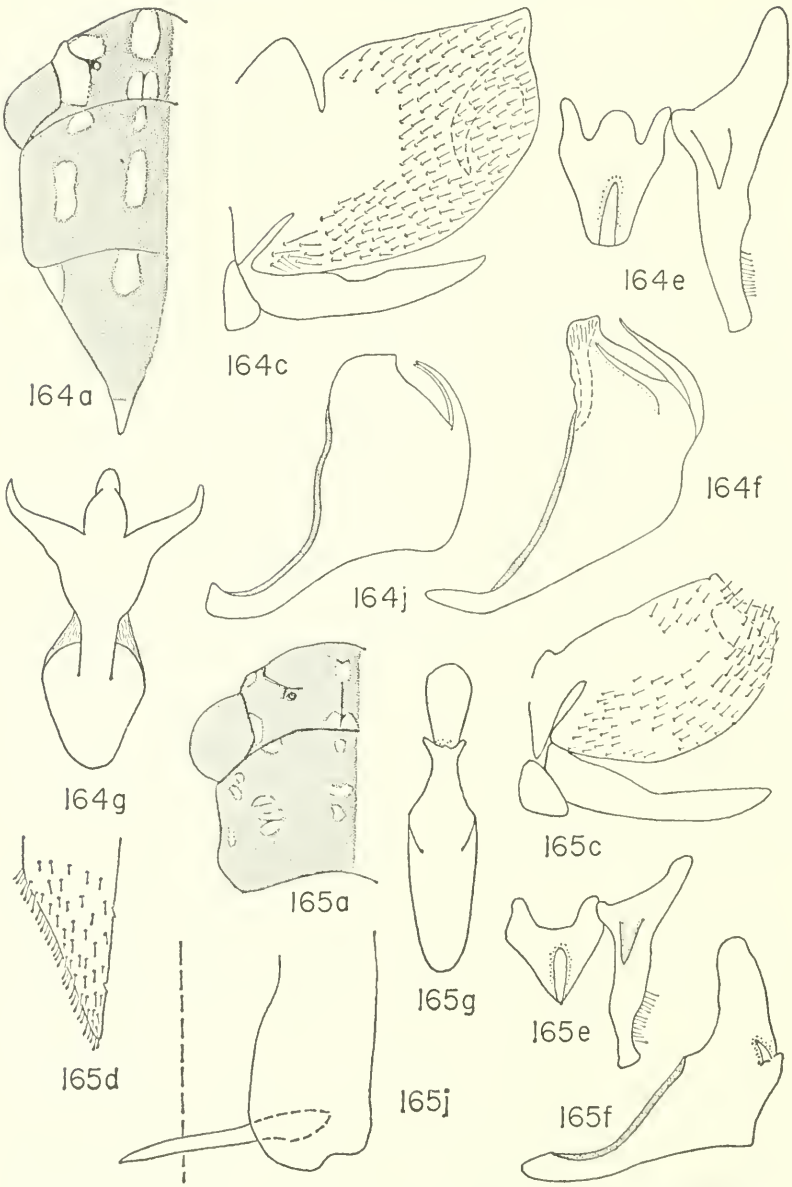
Female abdominal sternum VII with a median excision.

The range of *Egidemia* is from Mexico and Panama to Peru, Brazil, and Argentina. The genus is related to *Oncometopia*, sensu stricto (p. 222), from which it can be distinguished by its much narrower form, the absence of, or (usually) the location of the pygofer processes when present, its consistently fused claval veins, its lack of pubescence on the crown of the head, the translucent or hyaline texture of the forewings, the striated posterior portion of the scutellum, its narrower connective, and its less massive aedeagus.

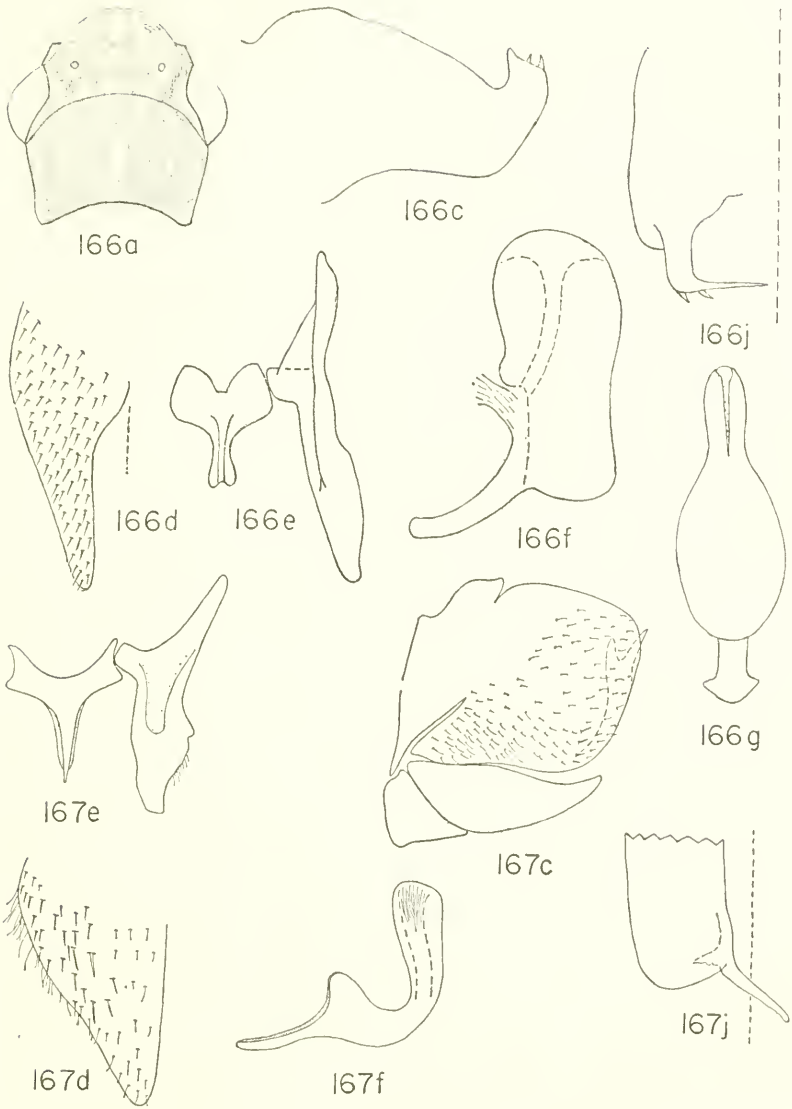
The interpretation of *E. obtusata* (Melichar) is based on a male specimen in MMB which bears a lectotype (invalid) and a syntype label. There is a conspecific female in HNHM. Schröder had studied the male, and the aedeagus agrees with his illustration (1960b, pl. 46), except that the figure of the aedeagus in lateral aspect is reversed. The aedeagus is actually curved dorsally, instead of posteroventrally at its apex. Externally *E. obtusata* differs considerably from other species of *Egidemia*. The interpretation of *E. proxima* (Melichar) is based on a male specimen which bore a holotype label in MMB. This specimen had also been studied by Schröder. There are no pygofer processes in this species.

The genitalia of a male specimen of *Egidemia fowleri* (Distant), agree well with figure 167.

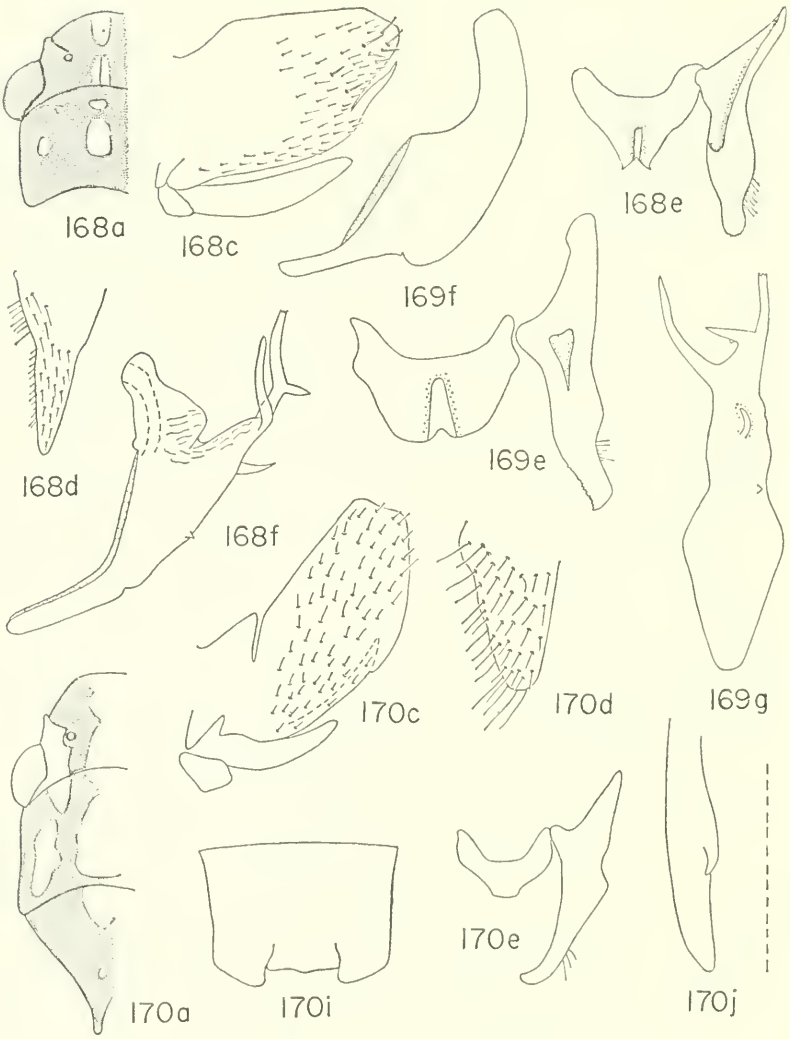
The interpretation of *Egidemia speculifera* (Walker) is based on a comparison of the female holotype with figure 168a, which also agrees with Schröder's (1960b, pl. 45) interpretation of *E. tredecimpunctata* (Signoret) and with the lectotype of *E. similis* (Schmidt).



FIGURES 164, 165.—**164,** *Egidemia anceps* (Fowler): **a-f** from specimen from Cerro Zunil, Guatemala; **j,** from Vera Cruz, Mexico. **165,** *E. paranceps,* new species, holotype: **j,** pygofer apex, left side, ventral view.



FIGURES 166, 167.—**166,** *Egidemia inflata*, new species, holotype (setae and plate not shown in **c**): **j,** pygofer apex, right side, caudoventral view. **167,** *E. fowleri* (Distant), specimen from Colima, Mexico: **j,** pygofer apex, right side, ventral view.



FIGURES 168–170.—168, *Egidemia speculifera* (Walker), specimen from Santa Catarina, Brazil. 169, *E. proxima* (Melichar), lectotype. 170, *E. obtusata* (Melichar) (a and i from specimen in HNHM; others from "lectotype" in MMB): j, pygofer, right side, caudoventral view.

SPECIES OF EGIDEMIA

[*Type not seen.]

anceps (Fowler), 1899c:234 (*Oncometopia*). Mexico, Guatemala, Panama.
fowleri (Distant), 1903b:67 (*Oncometopia*). Mexico.
inflata, new species. Mexico, Br. Honduras, Cuba?
obtusata (Melichar), 1925a:406 (*Oncometopia*). Peru. New combination.
paranceps, new species. Costa Rica, Panama.
proxima (Melichar), 1925a:407 (*Oncometopia*). Mexico.
speculifera (Walker), 1851b:790 (*Proconia*). SE. Brazil, Paraguay, N. Argentina. New combination.
**tredecimpunctata* (Signoret), 1855b:231 (*Tettigonia*).
similis (Schmidt), 1928c:76 (*Dichometopia*). New synonymy.

KEY TO MALES OF EGIDEMIA

1. Aedeagus without processes 2
   Aedeagus with processes. 4
2. Pygofer narrow, elongate, gradually tapered, truncate at apex in lateral aspect (fig. 166) . . . . . E. inflata, new species
   Pygofer broad, short, rounded apically 3
3. Pygofer process branched, aedeagus in lateral aspect narrowest in basal third of its length (occurs in Mexico).
   E. fowleri (Distant) (fig. 167)
   Pygofer process not branched, aedeagus in lateral aspect narrowest in apical half of its length (occurs in Brazil).
   E. speculifera (Walker) (fig. 168)
4. Aedeagus asymmetrical . . . . E. proxima (Melichar) (fig. 169)
   Aedeagus symmetrical 5
5. Pygofer with processes arising dorsoapically 6
   Pygofer processes arising ventrally.
   E. obtusata (Melichar) (fig. 170)
6. Styles slightly expanded apically; aedeagal processes very short, their length not more than four times their width.
   E. paranceps, new species (p. 183)
   Styles not expanded apically, aedeagal processes with length many times their greatest width . . . . E. anceps (Fowler) (fig. 164)

Egidemia inflata, *new species*

FIGURE 166

Length of male 10.5 mm.; of female 12.1–12.6 mm. Head with median length of crown from two-thirds to three-fourths transocular width and from slightly more than one-third to almost half interocular width, anterior margin broadly rounded in dorsal aspect, with a weak

M-shaped elevation bordering posterior margin, antennal ledges each with a small concavity on anterior margin, transclypeal suture incomplete; pronotum with disc rugose and punctate; forewings hyaline, with a sclerotized area along costal margin from fork of vein R almost to apex of central anteapical cell; posterior femoral setal formula 2:1:1:1; first posterior tarsomere with length approximately equal to combined length of second and third tarsomeres. Male pygofer gradually narrowed posteriorly, the apical portion curved abruptly dorsally and ending in a slender apical process which bears two teeth at its base, pygofer disc with numerous dispersed microsetae; plates extending posteriorly as far as pygofer apex, each slender, triangular, with mesal margin concave near base, with numerous evenly dispersed microsetae; style extending much farther posteriorly than apex of connective; connective Y-shaped, the stem about equal in length to arms and with a median keel; aedeagus with shaft inflated in lateral aspect, broadly rounded at apex, in ventral aspect abruptly narrowed at midlength.

Female abdominal sternum VII with a median excision which bears a median convex projection. Ground color of crown, pronotum, and scutellum castaneous to black with an incomplete median stripe on crown, spots before and behind the ocelli, a spindleform marking along each inner eye margin, the antennal ledges, three spots bordering anterior pronotal margin, five on pronotal disc, a short linear marking on each humerus, three spots on basal margin of scutellum, a pair behind transverse impression and the extreme apex, yellow; forewing hyaline, the sclerotized portion purple, marked with a pair of orange spots before bases of outer two anteapical cells and a similar spot near apex of each of these cells; face with a broad reddish-fuscous median area which bears two yellow spots at apex, a large round area on each side of upper portion of clypeus, continued as a wide pale line across pleura, yellow.

Holotype male, with label "Interception/Mex. or Cuba" in USNM. An additional specimen from British Honduras and one from Chiapas, Mexico (IZP); one male, Vera Cruz, Mexico, December (CAS); two females, Yucatán, Mexico, July (UCAL); and one male, British Honduras, September (NCS) have been studied.

This species slightly resembles *E. paranceps*, new species, in the arrangement of the markings on the anterior dorsum, but differs in its much more produced head, in its sclerotized area along the costal margin of the forewing, and markedly in the male genitalia.

Egidemia inflata is one of two species which Fowler interpreted as *Oncometopia speculifera* (Walker) in 1899. Distant (1908b:67) correctly stated that Fowler had misdetermined Walker's *O. speculifera*. He

described (loc. cit.) Fowler's species as *Oncometopia fowleri*, placing a type label on a specimen from Fowler's original series. The description is valid. The type chosen by Distant, however, was not the same species which Fowler illustrated. This second of the two species which Fowler misdetermined as *O. speculifera* (Walker), and the one he illustrated, was left without a name and is described above as *E. inflata*, new species.

Egidemia paranceps, *new species*

FIGURE 165

Length of male 12.0 mm. Head with median length two-thirds interocular width, approximately one-third transocular width, without an M-shaped elevation bordering posterior margin, clypeus almost flattened in lateral aspect, transclypeal suture incomplete; pronotum with disc rugose and punctate; forewing translucent, without a sclerotized costal area in region of anteapical cells; hindlegs with femoral setal formula 2:1:1; first tarsomere with length about equal to combined length of second and third. Pygofer moderately produced, disc with numerous microsetae, with a few interspersed macrosetae near apex, processes arising posterodorsally and extending mesally across median line, each narrow and tapering; plates extending almost as far posteriorly as apex of pygofer, without macrosetae; style extending much farther posteriorly than apex of connective, slightly narrowed anteapically, expanded and subtruncate at apex; connective Y-shaped, with a distinct median keel; aedeagus narrowest in apical half in lateral aspect, with a pair of short spinelike processes near middle of posteroventral margin, these joined across caudoventral margin of shaft which appears constricted at their origin in caudoventral view. Color of anterior dorsum brown, crown with a pair of spots at base, an elongate median spot near apex, a spot bordering inner margin of each eye, antennal ledges, five spots bordering anterior pronotal margin, a row of five spots across middle of disc, three spots across base of scutellum, a pair of spots behind transverse sulcus, and extreme apex of scutellum, orange; an orange spot in base of inner anteapical cell of forewing; face sordid brown, the clypellar apex and a large spot on genae below each eye, paler brown.

Holotype male, "Estrada, 59–453" (USNM). Additional specimens have been studied from Bat Cave, Panama, and from Costa Rica.

E. paranceps, new species, resembles *E. anceps* (Fowler) in form, and *E. inflata*, new species, in markings. It can be distinguished from *E. anceps* by the form of the aedeagus, with its short processes, and by its enlarged, truncate style apices. Differences between this species and *E. inflata* have been discussed in the description of the latter (p. 182).

42. *Genus* PHERA Stål

FIGURES 171–179

Phera Stål, 1864a:77. Type-species: *P. tiarata* Stål, which is a junior synonym of *Tettigonia centrolineata* Signoret, by subsequent designation of Schmidt, 1911b:294.

Capinota Melichar, 1926a:319. Type-species: *C. fowleri* Melichar, by original designation and monotypy. New synonymy.

Length 7.5–12.0 mm.

Head strongly produced, its median length exceeding interocular width, occasionally exceeding transocular width, anterior margin in dorsal aspect varying from rounded to angulate, crown usually rounded to face, rarely with a carina separating the two, ocelli located on or slightly behind a line between anterior eye angles, each approximately equidistant between adjacent anterior eye angle and median line, usually with an M-shaped elevation bordering posterior margin, without a longitudinal carina laterad of each ocellus (exception: *P. mirandensis* new species), with a median fovea which may be complete or partial (not extending to apex), disc without setae, lateral clypeal sutures extending onto crown and attaining ocelli; antennal ledges, protuberant in dorsal aspect, with or without longitudinal fovea, carinate or not dorsally in lateral aspect, anterior margins variable, from scarcely to steeply declivous; clypeus convex or slightly flattened medially, muscle impressions distinct or not; transclypeal suture obscure; face finely pubescent below; clypellus not protuberant, its contour continuing profile of clypeus.

Thorax with pronotal width less than transocular width of head, lateral margins parallel or divergent anteriorly, disc punctate or rugose and punctate, without pubescence, in lateral aspect with dorsopleural carina complete and arched downward; procpimeron with lower marginal area depressed and with length of remainder equal to or greater than width; posterior portion of scutellum with or without transverse striations. Forewing variable, from completely hyaline to coriaceous with an apical membrane, veins elevated and distinct, sculpturing variable, with four apical cells, the base of fourth more proximal than base of third, claval veins usually fused for some distance at midlength, without an anteapical corial plexus of veins and without anteapical supernumerary veins to costal margin; wings of female in rest position concealing ovipositor. Hindwing extending almost as far posteriorly as apex of forewing; vein R_{2+3} incomplete. Anterior tibiae gradually and slightly dilated apically. Hindlegs with knees not attaining posterior proepimeral margins, femoral setal formula 2:0:0, 2:2:1, 2:1:1, or 2:1:1:1; first tarsomere with length equal to or less than combined length of second and third tarsomeres.

Male genitalia: Pygofer in lateral aspect very broad, with numerous dispersed microsetae on posterior half and on ventral portion of basal half, with or without processes. Plates separate throughout their length, not extending as far posteriorly as pygofer apex, triangular, with numerous dispersed microsetae and occasionally with interspersed macrosetae. Style extending farther posteriorly than apex of connective, usually with distinct preapical lobe, narrowly rounded, truncate, or angulate, at apex. Connective Y-shaped with arms widely divergent, each much longer than the short stem which has a median keel. Aedeagus symmetrical or not, with basal ventral processes which are branched or not. Paraphyses absent.

Female abdominal sternum VII variable.

Phera has a disjunct distribution, occurring in Texas, Mexico, Central America, Venezuela, Colombia, and southeastern Brazil. It is closely related to *Homalodisca* from which it may be distinguished by the proepimeron which is depressed along its ventral margin, the non-depressed portion being longer than breadth without the depression, the entire proepimeron broader than long in *Homalodisca*. It is also closely related to *Pseudophera* from which it may be distinguished by its smaller size and the difference in the shape of the dilation of the metepimeron which is a thick rounded lobe in *Pseudophera*; projecting and angular in *Phera*.

No specimens of *Capinota fowleri* Melichar have been seen by me, and the genus is placed in synonymy under *Phera* solely on the basis of the original description, which unquestionably applies to *Phera* and possibly to the type-species of the latter.

Phera centrolineata (Signoret) has been collected on lettuce in Hidalgo, Texas, and on corn and potatoes in Antigua, Guatemala. An undetermined species from Agave in El Salvador has been examined.

There is a considerable amount of variation in color and in the male genitalia of some of the species. Characters other than the male genitalia have been found to be of greatest use in separating species. The male genitalia of *P. aterrima* Fowler and *P. lanei*, new species, are identical. *P. unipunctata* Evans is not included in the key; judging from the original description, it is very close to *P. obtusifrons* Fowler. The male lectotype of *Phera angustata* (Melichar) is very similar to the male of *P. centrolineata* (Signoret) illustrated in figure 171, and is possibly conspecific; the minor differences are illustrated in figure 175. Schröder (1959a:47) mentioned having seen the type (presumably lectotype) of *Phera centrolineata* (Signoret), but I have not seen this specimen and no lectotype designation has been published; the present interpretation of this species agrees with Schröder's (pl 7, figs. 86, 87) interpretation. *P. nigrilux* (Walker) and *P. tiarata* Stål are placed in synonymy under

260-649—68——13

centrolineata as the result of a study of the holotype and lectotype, respectively, both females; the minor differences in each, from the abdominal sternum VII, are illustrated in figure 171i.

The lectotype of *P. carbonaria* (Melichar) agrees with figure 172 except that there is a short basiventral triangular pygofer process not shown in the figure.

The present interpretation of *Phera luciola* (Signoret) is based on the original illustration, on Fowler's illustration, and on a male specimen in the USNM determined by E. D. Ball—all three of which appear to apply to the species presently illustrated. The lectotype of this species is without head or abdomen.

The male genitalia of the lectotype of *Phera obtusifrons* Fowler agree with figure 178.

SPECIES OF PHERA

[*Type not seen. **No specimens seen.]

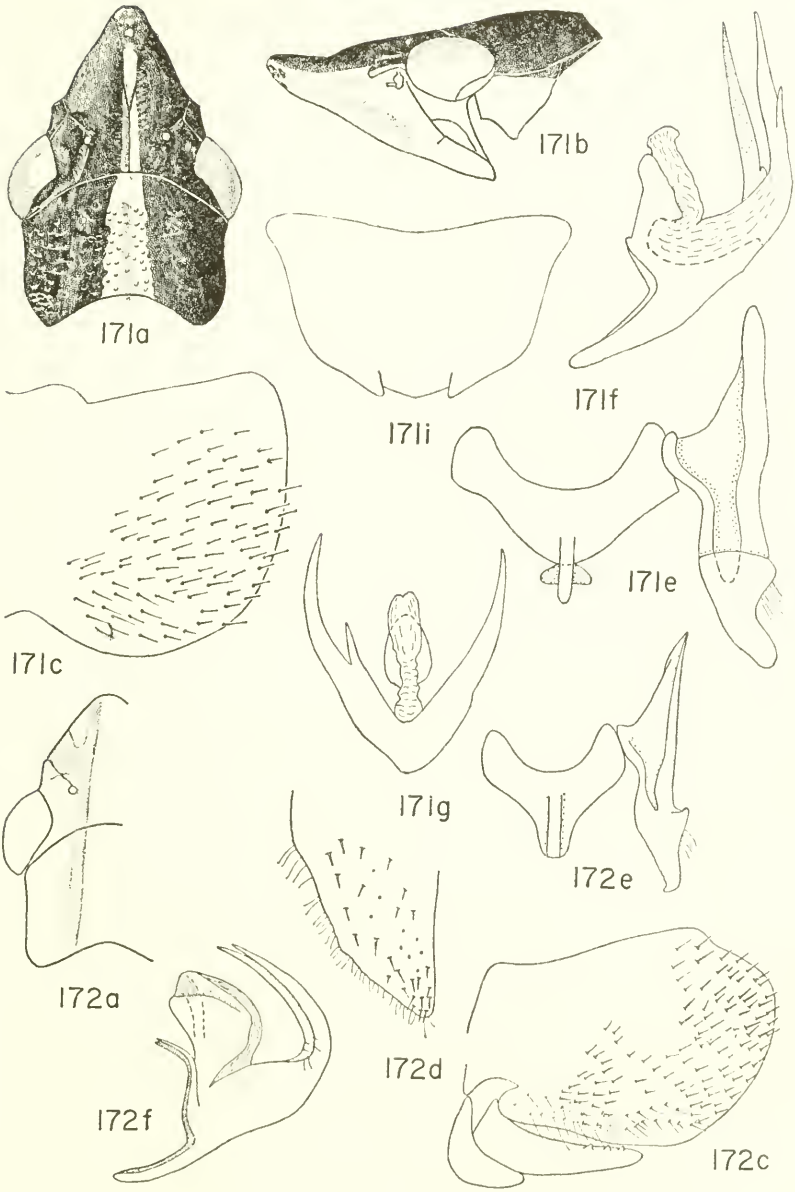
angustata (Melichar), 1924a:232 (*Homalodisca*). Brazil. New combination.
aterrima Fowler, 1899a:224. S. Mexico.
carbonaria (Melichar), 1924a:234 (*Homalodisca*). SE. Brazil, Paraguay. New combination.
**centrolineata* (Signoret), 1855b:239 (*Tettigonia*). S. Texas, Mexico, Guatemala.
nigrilux (Walker), 1858b:246 (*Ciccus*).
tiarata Stål, 1864a:79. New synonymy.
***fowleri* (Melichar), 1926a:320 (*Capinota*). New combination.
lanei, new species. Mexico.
luciola (Signoret), 1855b:239 (*Tettigonia*). Mexico.
maculiventris (Schmidt), 1928c:57 (*Homalodisca*). Colombia. New combination.
mirandensis, new species. Venezuela.
obtusifrons Fowler, 1899a:223. NW. and S. Mexico, Guatemala, El Salvador, Costa Rica, Venezuela.
***unipunctata* Evans, 1947a:253.
***wallengreni* Stål, 1864a:78.

KEY TO SPECIES OF PHERA

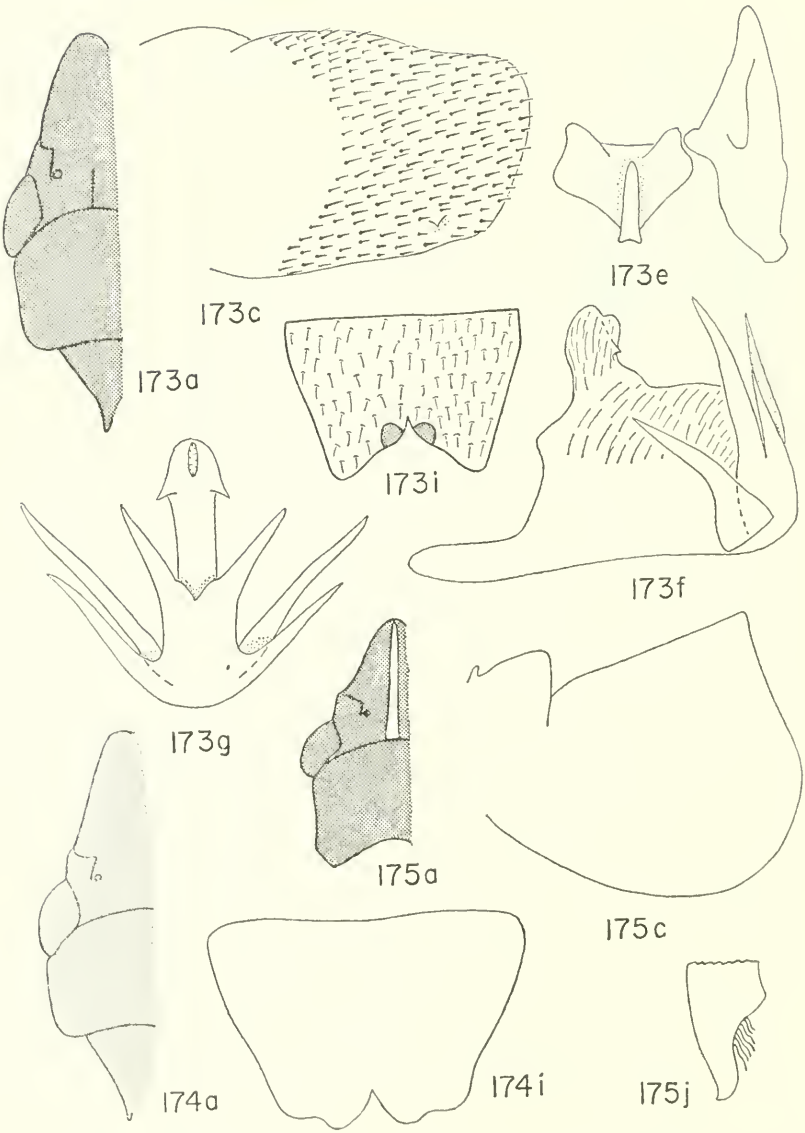
Not included: *fowleri* (Melichar), *unipunctata* Evans, and *wallengreni* Stål.

1. Forewings coriaceous 2
   Forewings almost entirely membranous 3
2. Female abdominal sternum VII with posterolateral portion of posterior margin extending farther posteriorly than portion adjacent to median excision . . . . P. aterrima Fowler (fig. 173)
   Female abdominal sternum VII with posterolateral portion of posterior margin not extending as far posteriorly as portion adjacent to median excision (fig. 174).

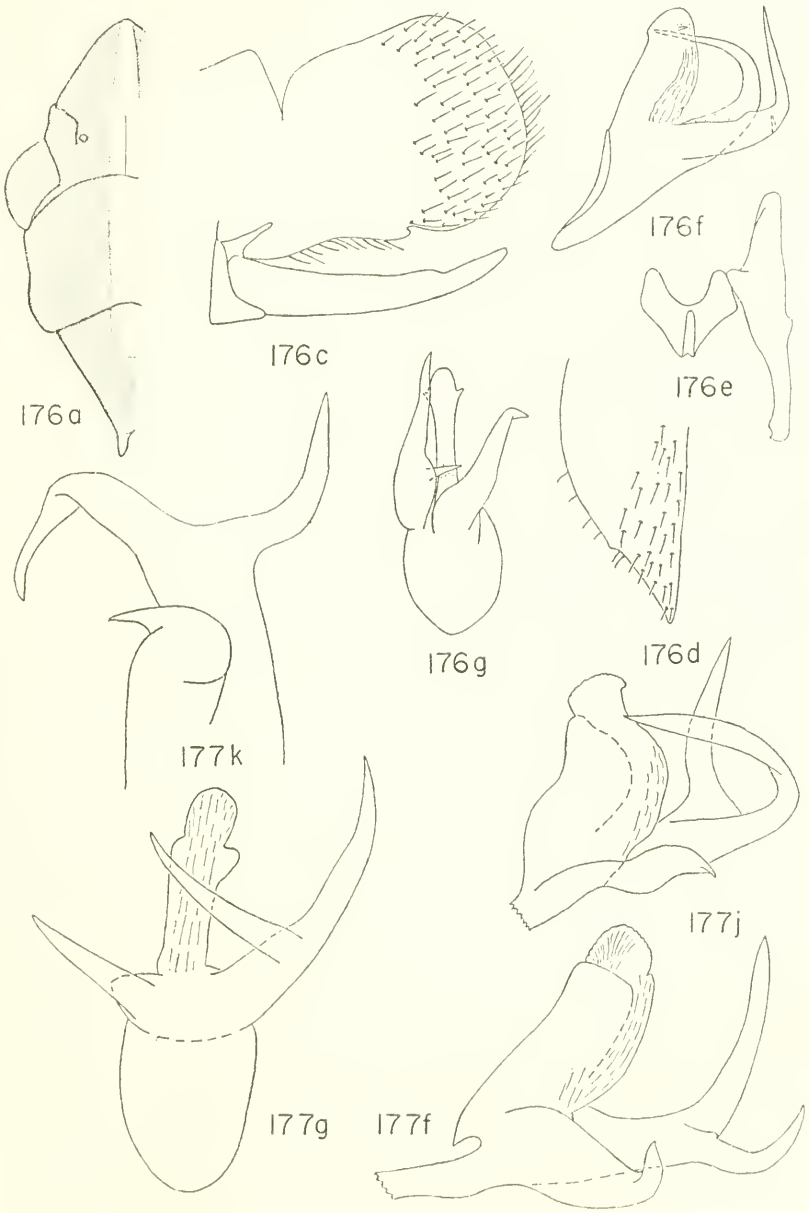
P. lanei, new species (p. 191)



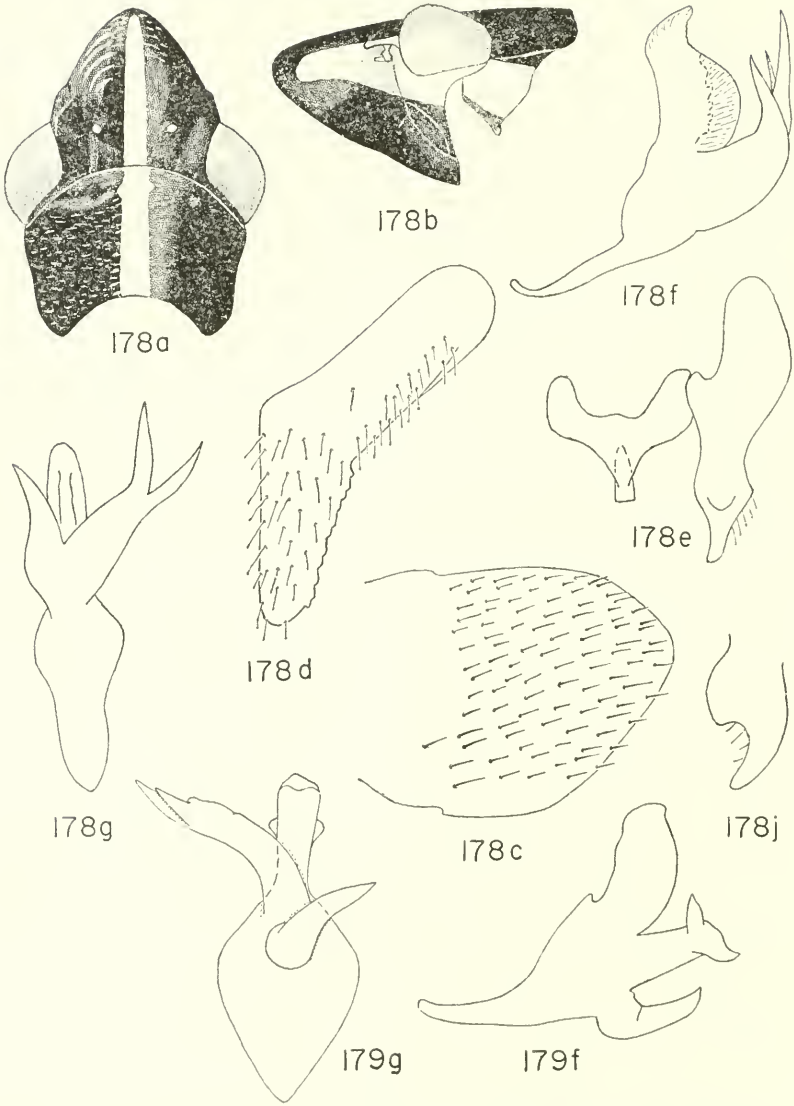
FIGURES 171, 172.—**171**, *Phera centrolineata* (Signoret): **a-g** from specimen from Hidalgo, Texas; **i**, from Orizaba, Mexico. **172**, *P. carbonaria* (Melichar), specimen from Santa Catarina, Brazil; reduced pygofer process not shown in **c**.



FIGURES 173–175.—**173,** *Phera aterrima* Fowler: a and i from lectotype; others from specimen from Cuernavaca-Acapulco Road; plate not shown in c. **174,** *P. lanei*, new species, specimen from "Mexico." **175,** *P. angustata* (Melichar), lectotype (plate and setae not shown in c): j, style apex.



FIGURES 176, 177.—**176,** *Phera maculiventris* (Schmidt), lectotype. **177,** *P. luciola* (Signoret) (**f** and **g** from specimen from Vera Cruz, Mexico; **j** and **k,** from Cuernavaca-Acapulco Road, Mexico): **j,** aedeagus in lateral view; **k,** aedeagal processes in ventral view.



FIGURES 178, 179.—**178,** *Phera obtusifrons* Fowler, specimen from El Salvador (plate not shown in c): j, style apex, broadest aspect. **179,** *P. mirandensis*, new species, ho'otype.

3. Head with median length of crown equal to or greater than transocular width. . . . . **P. luciola** (Signoret) (fig. 177)
   Head with median length of crown less than transocular width . 4
4. Head with median area of crown coarsely granulate or transversely rugose behind apex. 5
   Head with median area of crown with a longitudinal elevation behind apex, not coarsely granulate nor transversely rugose.
   P. angustata (Melichar) (fig. 175)
   P. centrolineata (Signoret) (fig. 171)
5. Male with aedeagus symmetrical (southern Brazil and Paraguay).
   P. carbonaria (Melichar) (fig. 172)
   Male with aedeagus asymmetrical (northern South America and Central America). 6
6. Male plates abruptly narrowed near base (Central America).
   P. obtusifrons Fowler (fig. 178)
   Male plates very gradually narrowed apically (South America). . 7
7. Male plates in lateral aspect extending almost as far posteriorly as pygofer apex which is broadly rounded apically.
   P. maculiventris (Schmidt) (fig. 176)
   Male plates shorter; pygofer with posterior margin subangulate.
   P. mirandensis, new species (p. 192)

Phera lanei, *new species*

FIGURE 174

Length of male 9.1 mm.; of female 8.4–9.3 mm. Head with median length of crown approximately two-fifths greater than interocular width, and approximately equal to transocular width, with a median fovea extending almost full length of crown and slightly broadened anteriorly, without an apical carina between crown and face; antennal ledges in lateral aspect with a very shallow longitudinal depression, anterior margin sloping gradually to contour of face; clypeus flattened medially. Pronotal disc punctate on posterior three-fourths; scutellum transversely striate on posterior portion. Forewings of female at rest scarcely exceeding apex of ovipositor, coriaceous, with membrane including all of apical cells; clavus closely and corium sparsely punctate in basal half. Male pygofer elongate and with apical margin weakly convex; plates each triangular, extending posteriorly about half length of pygofer; style short, extending posteriorly beyond apex of connective, somewhat rounded apically; aedeagus with basal portion inflated, giving off three pairs of slender tapering processes. Female abdominal sternum VII with posterior margin bearing a median acutely angular excision (fig. 174i) which does not include the whole posterior margin as it does in *P. aterrima* Fowler. Color of anterior dorsum brick-red,

rarely gray, of forewings darker red. Face with a median black stripe.

Holotype and six additional females and one male, Jesús María, Nayarit, Mexico, June 26, 1955 (B. Malkin); topotypic females, July 6 and July 27; and two females, Arroyo Santiago, near Jesús María, Nayarit (UCAL); two females Cuernavaca Road, August 24 (USNM); one female, Mexico (SSM); females from Tejupilco, Temescaltepec, Mexico, June 17, July 2, and from 9 miles S. of Cuernavaca, Nov. 24 and December 9 (CAS).

This species is named in honor of the late Dr. John Lane, of São Paulo, Brazil, a good friend and a noted entomologist, who collected a specimen of this species in Mexico.

P. lanei is so closely related to *P. aterrima* Fowler that the male genitalia are identical in the two species. *P. lanei* is readily separable on the basis of its greater length, its more produced head, and the shape of the abdominal sternum VII of the female.

Phera mirandensis, *new species*

FIGURE 179

Length of male 12.0 mm.; of female 13.5 mm. Head with median length slightly greater than interocular width, much less than transocular width, anterior margin rounded in dorsal aspect, without a carina between crown and face, disc of crown with a longitudinal carina laterad of each ocellus, median fovea extending about one-half distance from base to apex; antennal ledges with a weak longitudinal fovea, not carinate dorsally in lateral aspect, anterior margins steeply declivous; clypeus convex medially, muscle impressions not very distinct. Thorax with lateral pronotal margins slightly divergent anteriorly, disc punctate; scutellum with posterior portion finely striate. Forewings smoky subhyaline, without an apical membrane, without sculpturing. Posterior femoral setal formula 2:1:1:1. Male pygofer similar to that of *P. maculiventris* (Schmidt), but with posterior margin subangulate and with microsetae much more numerous over disc. Plates not extending as far posteriorly as in *P. maculiventris*, and more slender, setae distributed more generally over the surface of each plate; style with distinct preapical lobe, truncate apically; aedeagus asymmetrical, with one of the two basal processes branched near its apex. Color of anterior dorsum black, with an indistinct paler median stripe extending through length of median fovea of head and posteriorly to posterior margin of pronotum. Wings smoky subhyaline, veins brown. Thoracic pleura and an area of gena below each eye cream-colored, color of remainder of face and thoracic venter black. Legs brownish black.

Holotype male, Rancho Grande, near Maracay, Venezuela, July 8, 1946, in collection of the Bronx Zoo (posterior tarsi are missing from the type); also a single female from Venezuela (MMB).

This species is closely related to *Phera maculiventris* (Schmidt), from which it may be distinguished by the characters mentioned in the key and in the above description.

43. Genus HOMALODISCA Stål

FIGURES 180–190

Homalodisca Stål, 1869a:63. Type-species: *Cicada triquetra* Fabricius, by subsequent designation of Distant (1908b:80).

Length 9.4–15.0 mm.

Head strongly produced, its median length almost always equal to or less than interocular width, and always less than transocular width, anterior margin rounded in dorsal aspect, usually with a slight angle at transition from crown to face, disc of crown flattened, with or without an M-shaped elevation bordering posterior margin, with a pit enclosed by the anterior angle of the M on each side, with an incomplete (complete in *H. insolita* (Walker)) narrow median fovea which becomes broader and shallower anteriorly, disc with or without setae; antennal ledges very slightly protuberant in dorsal aspect, each with a shallow longitudinal depression, carinate dorsally in lateral aspect, with anterior margin oblique; clypeus usually slightly flattened medially, occasionally depressed or convex, the dorsomedial clypeal area glabrous or pubescent, not granulose (exception: *H. insolita*), muscle impressions usually distinct; other head characters as in *Phera*.

Thorax with disc rugose and punctate (pitted in *H. insolita*), with or without pubescence, in lateral aspect with an oblique dorsopleural carina which is usually incomplete, not attaining posterior margin of eye; proepimeron without ventral depressed region as in *Phera;* other thoracic characters as in *Phera*. Forewing variable, from completely opaque and with or without a membrane, to almost completely hyaline and with a few coriaceous areas on corium near bases of anteapical cells, species with hyaline wings often with one or more supernumerary crossveins between veins M and Cu_1, other characters as in *Phera*. Hindwing as in *Phera*. Legs with posterior femoral setal formula 2:0:0, 2:1:0 or 2:1:1; first posterior tarsomere with length rarely greater, usually less than combined length of second and third tarsomeres, other leg characters as in *Phera*.

Male genitalia: Pygofer variable in form interspecifically, with numerous dispersed microsetae and occasionally with few interspersed macrosetae, usually with a process (often greatly reduced) arising on

ventral margin. Plates with length variable interspecifically compared with pygofer apex, separate throughout their length, each triangular, with numerous dispersed microsetae. Style extending as far posteriorly as apex of connective or not, with or without distinct preapical lobe, acute or rounded at apex. Connective T-shaped or Y-shaped with the arms widely divergent. Aedeagus symmetrical, with processes variable interspecifically. Paraphyses absent.

Female abdominal sternum VII with posterior margin variable interspecifically, from transverse and nearly rectilinear to emarginate with the emargination varying in shape.

Homalodisca is closely related to *Phera*, from which it may be distinguished by the form of the proepimeron, of which the lower marginal area is not depressed as in *Phera*, and of which the width is greater than the length. Specimens of *Homalodisca* are in general more robust than in *Phera* and with the head less strongly produced. *Homalodisca* is also closely related to *Propetes*, *Dichrophleps* and to *Oncometopia* in the discussions of which distinguishing characters are treated.

Melichar synonymized *Phera* with *Homalodisca* in his monograph (1924a:230) but there is as little reason for doing this as for combining *Homalodisca* and *Oncometopia* because the latter genera appear to be equally close. *H. insolita* (Walker) stands apart from the rest of the species of the genus in several respects, including the completely foveate disc of the crown, the style apex which is directed laterad and rounded at the tip, the peculiar form of the aedeagal processes, the pitted pronotal disc and the narrowly and deeply excised posterior margin of the female abdominal sternum VII. In spite of these differences it is not deemed advisable to erect a separate genus for *H. insolita* at this time.

The known distribution of *Homalodisca* is from central and southeastern United States through Central America and Baja California to Colombia, Ecuador, northern Brazil, Venezuela, Trinidad Island, and French Guiana. It also occurs in southeastern Brazil and Paraguay.

A number of females of species of *Homalodisca* are found with white plaques on the forewings. Turner and Pollard (1959a) have related how this happens at the time of egg-laying. They also point out that the phenomenon does not exist in *Cuerna costalis* (Fabricius). This may be a character of a generic importance in the Proconiini, and further study should be directed towards this feature. Pollard and Yonce (1965a) have related this habit to the length of tibial spines in the female.

Some species of *Homalodisca* are of economic importance. *H. coagulata* (Say) has been shown by Turner and Pollard (1959a) to be a primary natural vector of Phony Peach Disease in southern U.S. Their work

includes a color description of the adult, color and biometrical descriptions of the nymphs, distributional data, overwintering data, seasonal host plants, mating period, oviposition habits, feeding habits and parasite relationships. They listed a very large number of both woody and herbaceous food plants for *H. coagulata* (Say), both monocots and dicots.

H. insolita (Walker) was found by Turner and Pollard (1959a) to be capable of transmitting Phony Peach Disease experimentally, but it was doubtfully an efficient natural vector. These authors discussed the same features in relation to this species as are listed above for *H. coagulata* (Say). It is interesting to note that this species differs drastically from *H. coagulata* (Say) in food plants, being limited largely to Gramineae, and in its flight habits, seldom flying more than two feet above the ground. These drastic differences parallel the morphological differences found during the present study in the structure of the aedeagus, which is quite different in *H. insolita* from the other species of *Homalodisca*. In addition to the food plants of *H. insolita* listed by Turner and Pollard, this species had been collected in numbers on *Panicum dichotomoflorum* Michaux in Leesburg, Florida, by Warren Adlerz, and from *P. maximum* Jacquin in Costa Rica. Pollard has described (1965a) the stages of *H. insolita* and (1965b) its fecundity.

H. noressa, new species has been collected from cotton and oleander in Venezuela, but there is no indication that it is a pest species. *H. hambletoni*, new species has been collected on *Agave* in Yucatan. *H. ichthyocephala* (Signoret) has been collected on cantaloupe. *H. apicalis* Schmidt has been collected on apple, orange, and quince.

H. ignota Melichar was described from a distorted female, of which the asymmetrical sternal abdominal VII is here illustrated (fig. 189). In addition to the synonymy indicated in the check list there seems a good possibility that *H. nitida* (Signoret) should preempt *H. apicalis* Schmidt. The male genitalia of the lectotype of the latter agree well with figure 181.

Homalodisca lucernaria (Linnaeus) was described from "America." The type has not been seen. Subsequent writers have been in some agreement in restricting the locality to the Guianas (Metcalf, 1965a: 504) except Houttyn, whose record from China is surely an error. There is only one common, widespread species of *Homalodisca* in the Guianas, and this I have interpreted as *H. lucernaria* (Linnaeus), with the resulting synonymy in the check list below.

The commonest and most widespread species in Central America is interpreted here as *H. ichthyocephala* (Signoret). Some other authors have synonymized the Signoret name with *H. triquetra* (Fabricius), but Schröder (1957a: 256) removed the Central American species

from synonymy, and assigned to it the name *H. vitripennis* (Germar), in spite of the fact that the Germar species was described from Brazil. It is not possible to follow this because I have found none of the species with a range which included both Brazil and Central America. Signoret's *H. ichthyocephala* was described from Central America and his illustration of the habitus would fit the common Central American species. It is in this sense that the name *H. ichthyocephala* (Signoret) is here applied. The type of *H. ichthyocephala*, like that of *H. vitripennis* (Germar), was presumably in the Germar collection, hence the true identity of the Germar name must remain in doubt.

The genitalia of the male lectotype of *Homalodisca ignorata* Melichar are like those of *H. apicalis* Schmidt except for the structures illustrated (figs. 181, 182). The male genitalia of the lectotype of *H. indefensa* Melichar agree with figure 186.

Illustrations published in my (1958a) synopsis of the species of *Homalodisca* occurring in North America are not repeated here. *H. atrata* (Fowler) is placed in the synonymy of *H. insolita* (Walker) on the basis of a study of the genitalia of a male specimen compared with the lectotype of the latter.

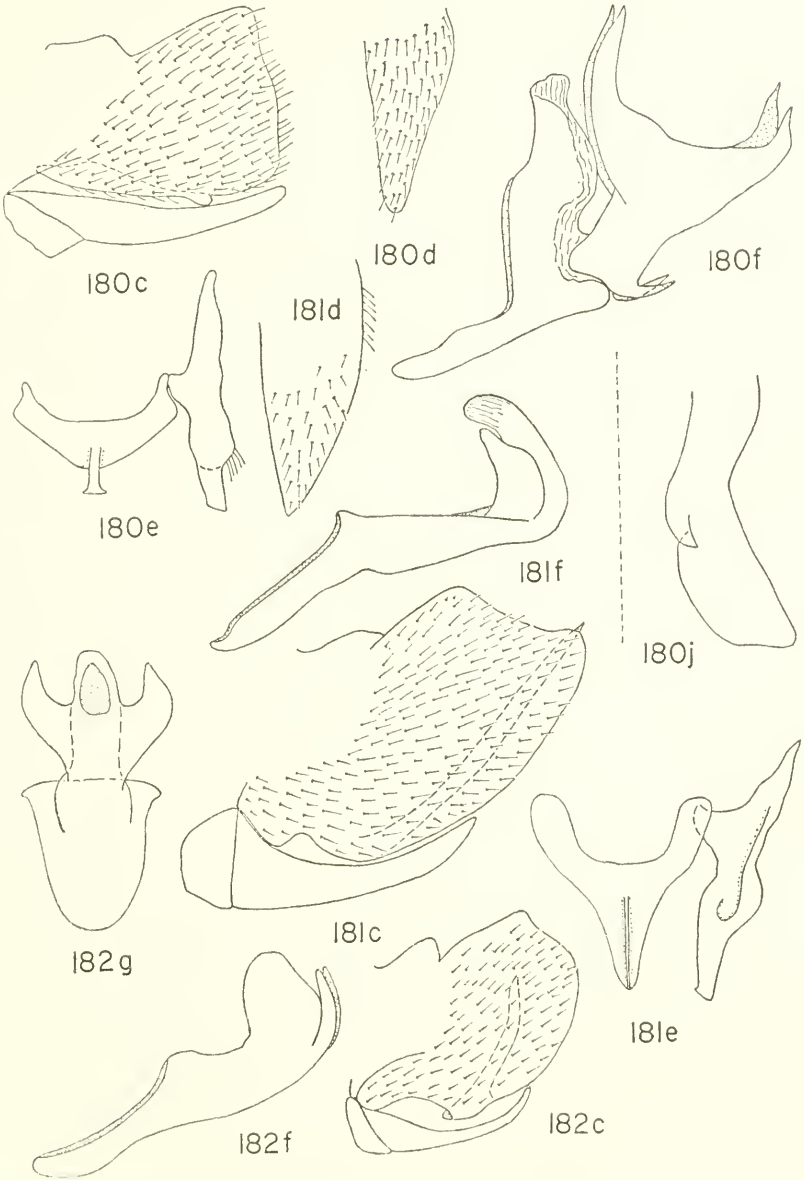
The holotype of *Homalodisca aurigena* (Walker) and the lectotype of *H. admittens* (Walker) are both females. The markings of the anterior dorsum of both are like Fowler's (1899a, pl. 14) illustration of *Phera vitripennis* (Germar).

The lectotype of *Homalodisca excludens* (Walker) is moulded and the original description is poor; it is certainly a *Homalodisca*, but the specific identity is unknown.

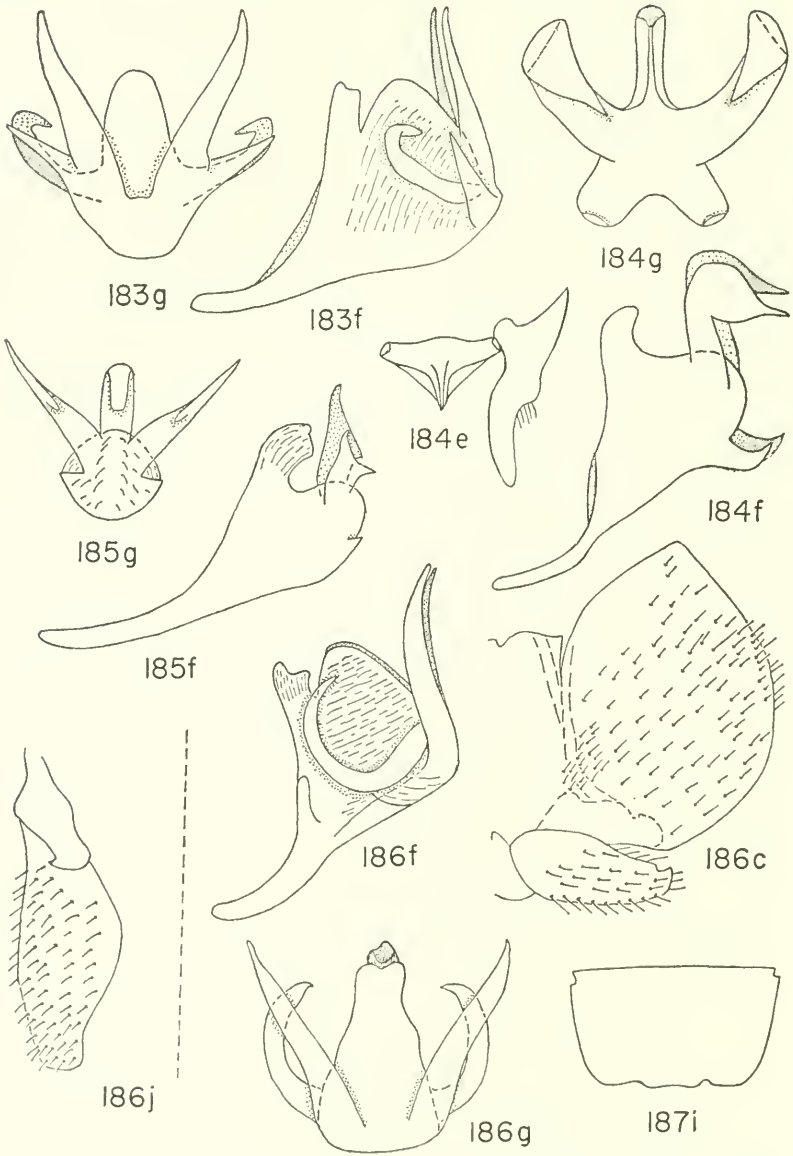
SPECIES OF HOMALODISCA

[*Type not seen. †Known only from female. §No specimens seen.]

†*admittens* (Walker), 1858b:227 (*Proconia*). Mexico.
†*aurigena* (Walker), 1858b:228 (*Proconia*).
apicalis Schmidt, 1928c:58. Costa Rica.
coagulata (Say), 1832a:13 (*Tettigonia*). S. U.S.A., Mexico.
cornuta, new species. Guatemala.
elongata Ball, 1936a:17. Texas, Arizona.
†*excludens* (Walker), 1858a:98 (*Proconia*). Venezuela.
hambletoni, new species. Mexico.
**ichthyocephala* (Signoret), 1854c:494 (*Tettigonia*). Arizona, S. Texas, Mexico, Guatemala, El Salvador, Costa Rica.
ignorata Melichar, 1924a:240. Paraguay.
†*ignota* Melichar, 1924a:235. Brazil.
indefensa Melichar, 1924a:239. Costa Rica.



FIGURES 180–182.—180, *Homalodisca triquetra* (Fabricius): j, pygofer, left side, ventral view. 181, *H. apicalis* Schmidt, specimen from Costa Rica. 182, *H. ignorata* Melichar, specimen from Santa Catarina, Brazil.



FIGURES 183–187.—**183,** *Homalodisca noressa*, new species, holotype. **184,** *H. cornuta*, new species, holotype. **185,** *H, hambletoni*, new species, holotype. **186,** *H. indefensa* Melichar, specimen from Costa Rica: j, pygofer apex, right side in ventral view. **187,** *H. nitida* (Signoret), lectotype.

insolita (Walker), 1858b:227 (*Proconia*). S. U.S.A., California, Mexico, Guatemala, El Salvador, Costa Rica, Panama.

atrata (Fowler), 1899a:222 (*Phera*). New synonymy.

lacerta (Fowler), 1899b:225 (*Phera*). Arizona, S. California, Baja California, NW. and S. Mexico, Guatemala, Costa Rica.

liturata Ball, 1901b:48. New synonymy.

**lucernaria* (Linnaeus), 1758a:434 (*Cicada*). Br. and Fr. Guiana, N. Brazil, Venezuela, Colombia.

**brevirostris* (DeGeer), 1773a:203 (*Cicada*).

triangularis (Fabricius), 1803a:63 (*Cicada*), preoccupied. New synonymy.

separata Melichar, 1924a:238. New synonymy.

fabricii Metcalf, 1965a:501 (new name for *Cicada triangularis* Fabricius). New synonymy.

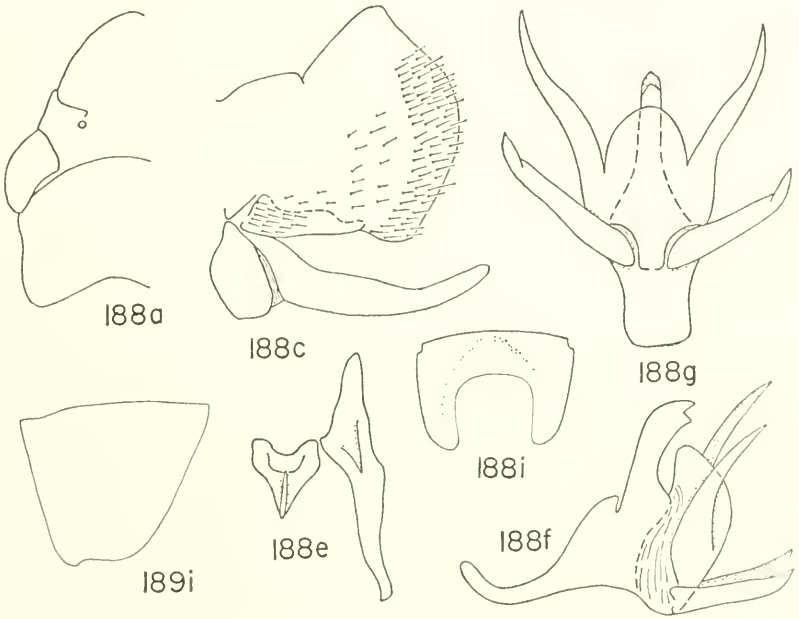
†*nitida* (Signoret), 1855d:799 (*Tettigonia*). Guatemala.

noressa, new species. Venezuela, Colombia.

†§*robusta* Schröder, 1957a:255.

triquetra (Fabricius), 1803a:63 (*Cicada*). S. America.

§*vitripennis* (Germar), 1821a:61.



FIGURES 188, 189.—**188,** *Homalodisca lucernaria* (Linnaeus): a from specimen from French Guiana; others, from Santarém, Pará, Brazil. **189,** *H. ignota* Melichar, lectotype.

KEY TO MALES OF HOMALODISCA

Not included (unknown or known only from females): *H. admittens* (Walker), *H. excludens* (Walker), *H. ignota* Melichar (fig. 189), *H. nitida* (Signoret) (fig. 187), *H. robusta* Schröder, *H. vitripennis* (Germar).

1. Forewing with corium entirely opaque 2
   Forewing with corium mostly hyaline, sclerotized only before apical cells 5
2. Aedeagus with a fringe of hairlike processes at apex, without other processes. . . . . **H. insolita** (Walker)*
   Aedeagus not so 3
3. Length 11 mm. or less; aedeagal shaft curved posteriorly at apex (known only from Arizona and Texas). . . **H. elongata** Ball*
   Length more than 12 mm.; aedeagal shaft curved anteriorly or dorsally (Brazilian and Central American species) 4
4. Pygofer processes extending beyond pygofer apex; aedeagus without ventral processes (Central America).
   H. apicalis Schmidt (fig. 181)
   Pygofer processes not attaining pygofer apex; aedeagus with a pair of ventral processes (Southern Brazil).
   H. ignorata Melichar (fig. 182)
5. Aedeagus with three pairs of processes 6
   Aedeagus with two pairs of processes. 7
6. Aedeagus with most ventral pair of processes small and inconspicuous . . . . . **H. triquetra** (Fabricius) (fig. 180)
   Aedeagus with most ventral pair of processes well developed.
   H. noressa, new species (p. 202)
7. Aedeagus with dorsal pair of processes shaped like head of a bird in lateral aspect . . . . . **H. cornuta**, new species (p. 202)
   Aedeagus with dorsal pair of processes not so 8
8. Aedeagus with dorsal pair of processes falcate apically.
   H. hambletoni, new species (p. 203)
   Aedeagus with dorsal pair of processes not so 9
9. Crown of head with distinct linear markings; aedeagus with ventral pair of processes very short . . . **H. lacerta** (Fowler)*
   Without above combination of characters 10
10. Aedeagus with ventral aedeagal processes as long as dorsal processes and smoothly curved throughout their length.
    H. indefensa Melichar (fig. 186)
    Not as above 11
11. Aedeagus with a deep concavity between shaft and bases of aedeagal processes 12
    Aedeagus without such a concavity . . . . **H. coagulata** (Say)*

*For illustration, see Young (1958a, pl. 2 (*liturata*=) *lacerta*).

12. Aedeagus with both pairs of processes elongate in caudal aspect (Northern South America). **H. lucernaria** (Linnaeus) (fig. 188)
Aedeagus with both pairs of processes short in caudal aspect (Central America) . . **H. ichthyocephala** (Signoret) (fig. 190)

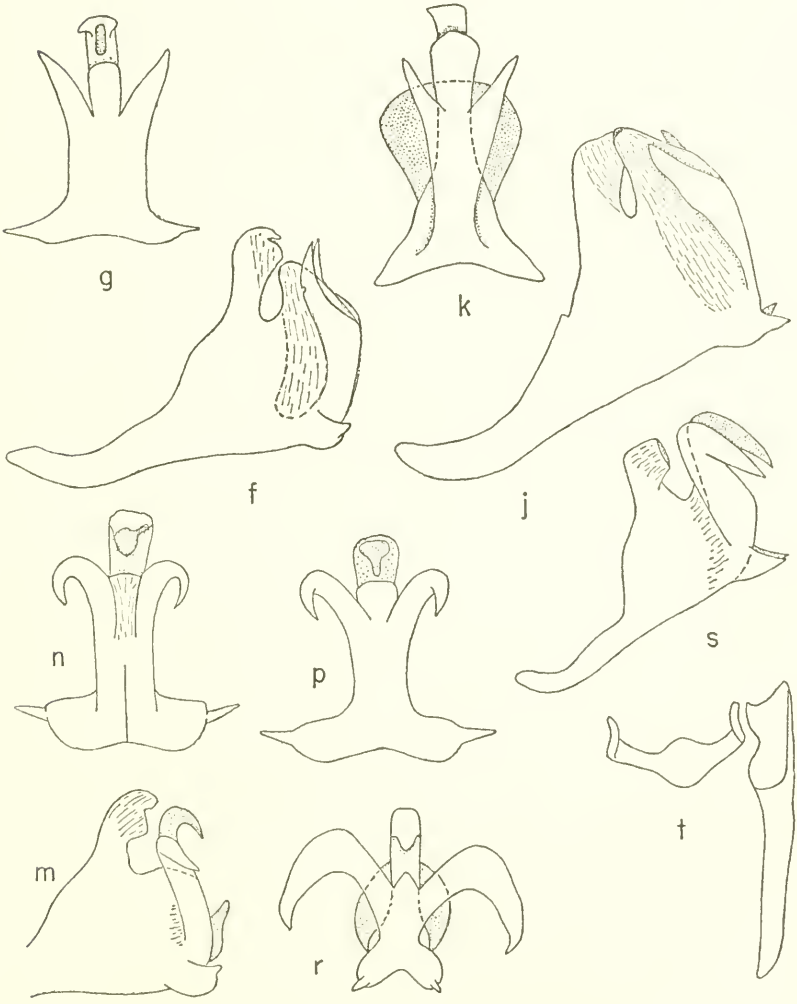


FIGURE 190.—*Homalodisca ichthyocephala* (Signoret) (**f** and **g** from specimen intercepted from Mexico; **j** and **k** from specimen from Michoacán, Mexico; **m** and **n** from one specimen and **p** from another from Acapulco, Mexico; **r-t** from specimen from Metapán, El Salvador): **g, k, n, p, r,** aedeagus in caudoventral view; **f, j, m, s,** aedeagus, lateral view; **t,** style and connective, dorsal view.

Homalodisca noressa, *new species*

FIGURE 183

Length of male 10.7–11.4 mm. Head with median length of crown equal to interocular width, disc rounded to face anteriorly, with a very weak M-shaped elevation bordering posterior margin, disc with short pubescence which is not very distinct; clypeus very slightly depressed medially, muscle impressions distinct. Thorax in lateral aspect with dorsopleural carina complete. Forewing hyaline, with sclerotized areas near bases of outer two anteapical cells, without supernumerary crossveins between veins M and Cu_1. Hindlegs with femoral setal formula 2:0:0 or 2:1:0; first tarsomere with length less than combined length of second and third tarsomeres. Male pygofer short, obliquely truncate apically, ventral process poorly developed; plates rounded apically, not extending nearly as far posteriorly as pygofer apex, short, triangular; style with distinct preapical lobe, apical portion elongate and rounded at tip; connective T-shaped, the stem narrow and strongly carinate; aedeagus with three pairs of processes, the dorsal pair slender, straight and tapering, the intermediate pair arched strongly posteriorly and ventrally in lateral aspect, the ventral pair angulate and shorter than the other two pairs. Color of crown, pronotum and basal portion of scutellum brown irrorate with dull white, apex of scutellum conspicuously yellow; sclerotized portions of forewings dark purplish; venter and legs dull yellow.

Holotype male, El Valle, Venezuela, Oct. 6, 1938 (C. H. Ballou), and one female topotype, March 23, other specimens, Caracas, on *Nerium oleander*, May 19; Boca del Río, July 9, on cotton; Carabobo, April 30, on *Gliricidia sepium;* Antimano, D. F., July 12, on *Spathodea campanulata;* all in Venezuela (USNM). Three males from Maracay, Venezuela (SSM); two specimens, Sevilla, Colombia (USNM); and one male, Carara, Colombia (ZIMH).

This and *H. triquetra* (Fabricius) are the only species in the genus having three pairs of aedeagal processes. The basal pair of processes is very greatly reduced, comparatively, in *H. triquetra* and the intermediate pair is not arched and decurved as in *H. noressa*, new species.

Homalodisca cornuta, *new species*

FIGURE 184

Length of male 12.0 mm.; of female 12.1 mm. Head with or without weak M-shaped elevation bordering posterior margin, otherwise as in *H. noressa*, new species. Thorax in lateral aspect with dorsopleural carina incomplete, ending distinctly behind eye. Forewing as in *H. noressa* but with one supernumerary crossvein between M and Cu_1 in type (not in

the other specimen), otherwise as in *H. noressa*. Hindlegs with femoral setal formula 2:1:0, otherwise as in *H. noressa*. Male pygofer short, posterior margin regularly, slightly convex, process poorly developed; plates very broad and short with apex curved dorsally, not extending as far posteriorly as pygofer apex; connective Y-shaped with stem short and carinate, arms widely divergent; aedeagus with two pairs of processes, the dorsal pair elbowed and avicephaliform in lateral aspect, the ventral pair much shorter and abruptly tapering. Color of crown, pronotum, and scutellum sordid pale brown, otherwise as in *H. noressa*. Female abdominal sternum VII with a shallow median regular concavity on posterior margin.

Holotype male, Esquinitla, Guatemala, May 27, 1923 (E. G. Smyth), and two females, Ayutla, Guatemala, (USNM).

In structure of the genitalia this species is closely related to *H. ichthyocephala* (Signoret), but it can be distinguished from this and all other species by the shape of the dorsal aedeagal processes.

Homalodisca hambletoni, *new species*

FIGURE 185

Length of male 10.9 mm.; of female 12.4 mm. Head with median length of crown almost equal to interocular width, somewhat angulate at transition from crown to face, disc without an M-shaped elevation bordering posterior margin, without pubescence (specimens possibly rubbed), other characters as in *H. noressa*, new species. Thorax with dorsopleural carinae complete (type) or incomplete. Forewing hyaline, without sclerotized areas (type) or with a slight, poorly delimited sclerotized area near base of outer two anteapical cells, with one or more supernumerary crossveins between veins M and Cu_1. Hindlegs with femoral setal formula 2:1:0, otherwise as in *H. noressa*. Male pygofer short, posterior margin slightly and regularly convex, ventral process poorly developed; male plates acute apically, extending almost as far posteriorly as pygofer apex; style without distinct preapical lobe, apex with a slight angular median projection; connective Y-shaped with stem short and carinate, arms widely divergent; aedeagus with preatrium elongate, shaft with a pair of dorsal processes which are falcate apically, and a pair of greatly reduced angular ventral processes. Color of crown and pronotum rich brown with disc of latter darker posteriorly, scutellum almost unmarked brown (type) or brown marked with paler brown flecks; sclerotized portion of forewing black when present; venter sordid yellow with irregular dark markings. Female abdominal sternum VII moderately produced, posterior margin with a V-shaped median emargination.

Holotype male, on agave, Mérida, Yucatán, Mexico, Sept. 13, 1946, "16924" (E. J. Hambleton), one female, and one specimen, same data, without abdomen (USNM); five specimens, Mérida, Yucatán (NCS).

This species is named in honor of Dr. E. J. Hambleton, whose collecting activities in the American tropics have contributed much to add to our knowledge of the neotropical fauna in various groups of insects.

This species appears to be related to *H. ichthyocephala* (Signoret), but can be distinguished from that species by the falcate dorsal and the very short ventral aedeagal processes, both of which are different in *H. ichthyocephala*.

44. *Genus* PROPETES Walker

FIGURES 191, 192

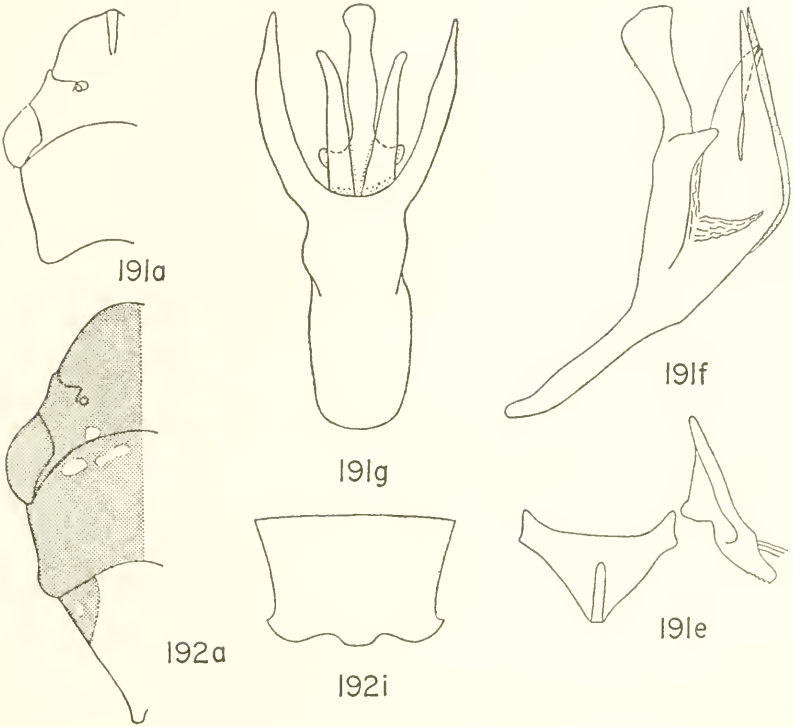
Propetes Walker, 1851a:797. Type-species: *P. compressa* Walker, by monotypy.

Length 12.5–16.5 mm.

Head strongly produced, its median length from slightly less to slightly greater than interocular width and approximately six-tenths transocular width, anterior margin very broadly rounded and with a weak median apical carina, without a carina separating crown from face, ocelli located on or slightly before a line between anterior eye angles, each slightly closer to median line than to adjacent eye angle, without an M-shaped elevation bordering posterior margin, disc with fine close-set pubescence; antennal ledges very slightly protuberant in dorsal aspect, each with a shallow longitudinal depression, carinate dorsally in lateral aspect, anterior margin oblique; clypeus strongly flattened medially, texture of its dorsomedial area longitudinally striate, face finely pubescent above, densely pubescent below, otherwise as in *Phera*.

Thorax with lateral margins divergent anteriorly, disc rugose, with or without pubescence, in lateral aspect with an oblique incomplete dorsopleural carina which is very slightly bisinuate, proepimeron with ventral margin not or only slightly depressed and with length much less than width; posterior portion of scutellum swollen and not striate. Forewing completely hyaline except fumose commissural area in basal portion of clavus, surface without sculpturing, middle anteapical cell with or without supernumerary crossveins, otherwise as in *Phera*. Hindwing extending posteriorly as far as bases of apical cells of forewing, otherwise as in *Phera*. Hindlegs with femoral setal formula 2:0:0; first tarsomere with length greater than combined length of second and third tarsomeres; other leg characters as in *Phera*. Abdomen constricted basally.

Male genitalia: Pygofer not strongly produced, very broad, posterior margin regularly convex, with a number of irregularly dispersed



FIGURES 191, 192.—**191,** *Propetes schmidti* Melichar, lectotype. **192,** *P. compressa* Walker, from lectotype of *P. trimaculata* Schmidt.

microsetae on disc, with a short process near base of ventral margin. Style short, extending about as far posteriorly as connective, with weak preapical lobe. Connective triangular, the arms widely divergent, carinate medially. Aedeagus symmetrical with pair of once-forked processes arising from base and a short process on each side of shaft near its midlength. Paraphyses absent.

Female abdominal sternum VII with posterior margin transverse, occasionally with slight projections but usually almost rectilinear.

Specimens of *Propetes* have been examined from Pará and Mato Grosso, Brazil, and from British Guiana. A female specimen from British Guiana, in the British Museum, appears to be a new species, but it is not described here. Only the females of *P. compressa* Walker and its junior synonym *P. trimaculata* Schmidt have been studied, and only the male of *P. schmidti* Melichar. The above description of the male genitalia is based on a dissection of the last. This genus is very poorly represented in collections; I have seen a total of seven specimens.

Propetes is very closely related to *Homalodisca* and may eventually

preempt the latter. The male genitalia of *P. schmidti* Melichar are quite close to those of *Homalodisca triquetra* (Fabricius), the type-species of *Homalodisca*. The two genera are not synonymized at this time, because the action is a grave one and because males of *P. compressa* Walker are unknown at this time. Species of *Propetes* can be distinguished from most species of *Homalodisca* by the presence of a complete transverse sulcus near the anterior margin of the pronotum, and the occurrence of a faint median longitudinal elevation at the apex of the crown, both of which characters are absent in *Homalodisca* spp., except the type. The abdomen of *Propetes* spp. is constricted basally, but this character also occurs in some species of *Homalodisca*.

SPECIES OF PROPETES

[†Known only from female.]

†*compressa* Walker, 1851b:797. N. and S. Brazil.
†*trimaculata* Schmidt, 1928c:62. New synonymy.
schmidti Melichar, 1925a:336. S. Brazil.

45. Genus PSEUDOPHERA Melichar

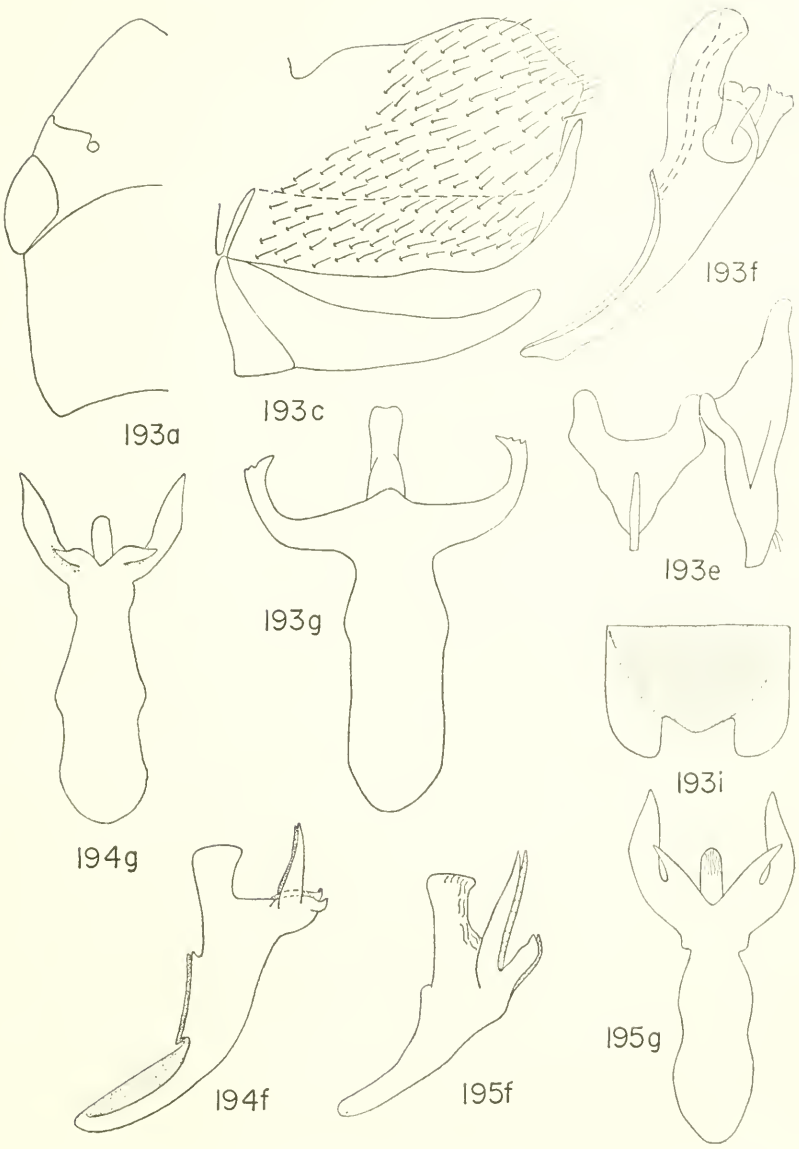
FIGURES 193–198

Pseudophera Melichar, 1925a:332. Type-species: *Proconia atra* Walker, by original designation.

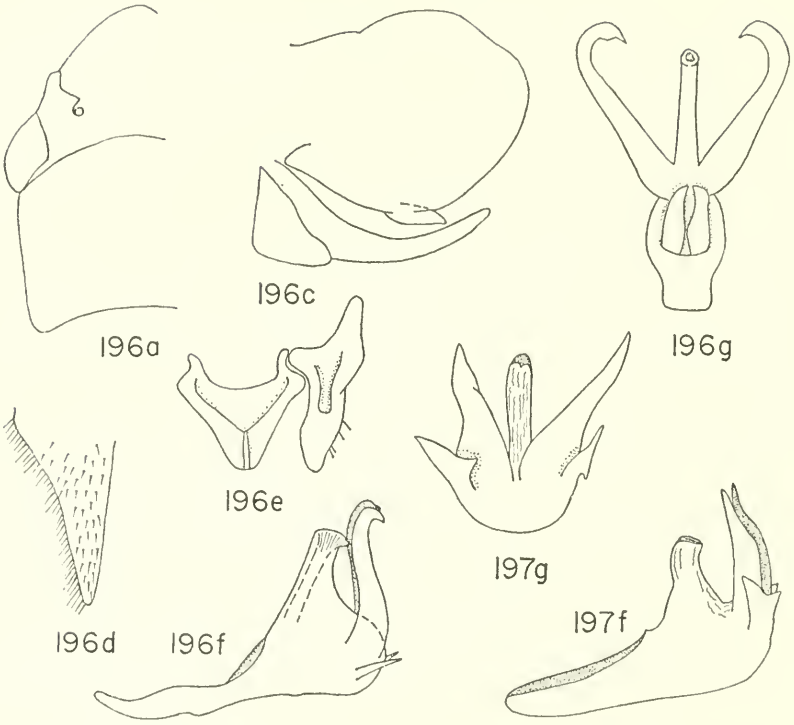
Length 16–20.5 mm.

Head strongly produced, median length exceeding interocular width, apex not carinate, ocelli much closer to posterior margin than to apex, located on a line between anterior angles of eyes, each about equidistant from adjacent eye angle and median line, surface usually without an M-shaped elevation bordering posterior margin, with or without a median fovea which is shallow and either partial or complete when present, disc without setae, lateral clypeal sutures extending onto crown and attaining ocelli; antennal ledges slightly protuberant in dorsal aspect, longitudinally foveate, in lateral aspect carinate dorsally, anterior margins not steeply declivous; clypeus regularly convex, not flattened nor depressed medially; transclypeal suture obsolete; face finely pubescent below; clypellus not produced, its contour continuing profile of clypeus.

Thorax with pronotal width less than transocular width of head, lateral margins divergent anteriorly, disc rugose and usually punctate, without pubescence, posterior margin concave, in lateral aspect with a complete dorsopleural keel which is slightly oblique and slightly curved downward near its anterior end; scutellum usually transversely striate on posterior portion. Forewing with membrane not sharply



FIGURES 193–195.—**193**, *Pseudophera divergens* Schmidt: **a-g** from lectotype of *P. procera* Melichar, **i** from specimen from Costa Rica. **194**, *P. atra* (Walker), specimen from Guatemala. **195**, *P. heterogena* Schmidt, lectotype.



FIGURES 196, 197.—**196,** *Pseudophera contraria* (Walker), specimen from Guatemala, setae not shown in **c. 197,** *P. truncata,* new species, holotype.

delimited anteriorly, including apical and a portion of anteapical cells, veins elevated and distinct, with only a few punctures parallel to veins in clavus and brachial cell, texture of clavus and corium usually strongly coriaceous, with only four apical cells, the base of fourth more proximal than base of third, middle anteapical cell with two or more crossveins, claval veins fused at middle, without an anteapical plexus of veins and without anteapical supernumerary veins to costal margin, wings of female at rest concealing ovipositor. Hindwing extending almost as far posteriorly as forewing; vein R_{2+3} incomplete. Tibiae of anterior legs slightly expanded apically. Hindlegs at rest with knees not attaining posterior proepimeral margins; femoral setal formula usually 2:0:0, occasionally 2:1:1; length of first tarsomere approximately equal to combined length of second and third.

Male genitalia: Pygofer strongly produced and rounded at apex, with numerous dispersed microsetae, with a process arising on ventral margin. Plates separate throughout length, usually not extending as

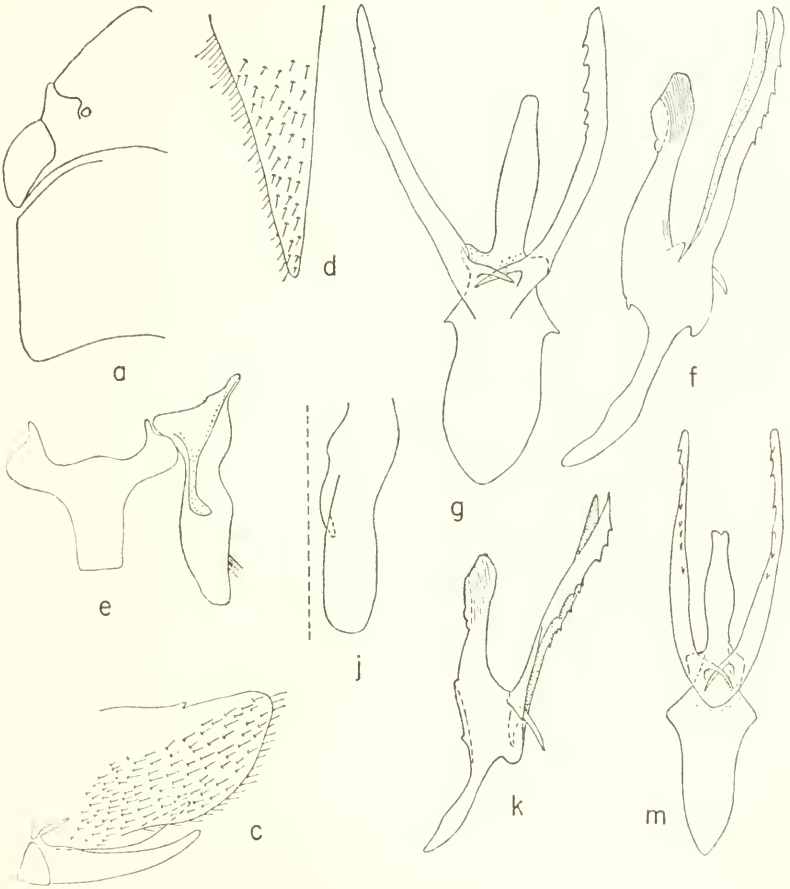


FIGURE 198.—*Pseudophera tibialis* Schmidt: a-j from lectotype; k and m from specimen from Balzapamba, Ecuador.

far posteriorly as pygofer apex, triangular, with numerous dispersed microsetae. Style extending posteriorly as far as or farther than apex of connective, without distinct preapical lobe, not or only slightly modified apically. Connective Y- or T-shaped, with or without a median keel. Aedeagus symmetrical or not, with anteapical paired ventral processes. Paraphyses absent.

Female abdominal sternum VII not strongly produced posteriorly, broadly emarginate medially and with a slight convexity within the emargination.

The range of this genus is from Mexico to the Guianas and to Ecuador. *Pseudophera* is very closely related to *Homalodisca*, from which it may be

distinguished by its larger size and by its earlike, thick, rounded lobe on the epimeron of the metathorax. The latter is thin, angular, and projecting in *Homalodisca*.

The genitalia of the male lectotype of *Pseudophera procera* Melichar agree well with those of *P. divergens* (Schmidt). The genitalia of the male lectotype of *P. atra* (Walker) agree with figure 194.

SPECIES OF PSEUDOPHERA

[*Type not seen.]

atra (Walker), 1851b:789 (*Proconia*). Honduras.
**contraria* (Walker), 1851b:789 (*Proconia*). Guatemala, Costa Rica.
divergens (Schmidt), 1911b:294 (*Phera*). Guatemala, Costa Rica.
procera Melichar, 1925a:334. New synonymy.
heterogena Schmidt, 1928c:60. S. Mexico, Panama, D. Guiana.
tibialis Schmidt, 1928c:61. Ecuador.
truncata, new species. Colombia.

KEY TO MALES OF PSEUDOPHERA

1. Aedeagus with a pair of short unbranched processes not extending as far distally as apex of shaft . P. divergens (Schmidt) (fig. 193)
   Aedeagus with two pairs of processes or with branched processes extending at least as far distally as apex of shaft 2
2. Length 17.5 mm. or less; aedeagus with two pairs of processes, the shorter pair truncate apically. . . . . P. truncata, new species
   Length 18 mm. or more; aedeagus without above combination of characters 3
3. Aedeagus with two pairs of processes which are separate basally. P. contraria (Walker) (fig. 196)
   Aedeagus with a single pair of branched processes. 4
4. Aedeagus with a pair of elongate ventral basal processes, each bearing a very short retrorse branch at base. P. tibialis Schmidt (fig. 198)
   Aedeagus with branches of ventral processes not retrorse. . . . 5
5. Aedeagus in lateral aspect with processes arising from a ventral projection. . . . . P. atra (Walker) (fig. 194)
   Aedeagus in lateral aspect with processes arising from shaft, not pedunculate . . . . . P. heterogena Schmidt (fig. 195)

Pseudophera truncata, *new species*

FIGURE 197

Length of male 16 mm.; of female 17.5 mm. Head in dorsal aspect with or without a shallow median fovea on posterior half of crown. Pronotum with disc rugose and punctate; scutellum transversely

striate on its posterior portion. Posterior femoral setal formula 2:0:0. Male pygofer in lateral aspect very broad, ventral process shorter than in most other species of genus; plates not extending as far posteriorly as apex of pygofer; style extending posteriorly slightly farther than apex of connective, rounded apically; connective Y-shaped with median keel on apical half of stem; aedeagus slightly asymmetrical, with pair of short convergent processes and pair of much longer processes which in lateral aspect exceed apex of shaft. Other structural characters as in generic description. Color not distinctive.

Holotype male, Hacienda Pehlke, Colombia (E. Pehlke), 1921, and eight topotypic females (IZP); one female topotype (NCS). The type series had been determined as *P. contraria* (Walker).

This species is closely related to *P. contraria* (Walker) but has the posterior pygofer margin more convex, and has neither pair of aedeagal processes curved mesally in caudoventral view.

46. Genus DICHROPHLEPS Stål

FIGURES 199–206

Dichrophleps Stål, 1869a:62. Type-species: *Cicada aurea* Fabricius, by monotypy.

Length 11.3–17.7 mm.

Head with median length equal to or slightly less than interocular width and from one-half to two-thirds transocular width, anterior margin varying from broadly to sharply rounded in dorsal aspect, without a carina at transition from crown to face, ocelli located on or slightly before a line between anterior eye angles, each usually equidistant from adjacent eye angle and median line, with or without an M-shaped elevation bordering posterior margin, nearly always with a shallow narrow partial median fovea; antennal ledges each with a longitudinal fovea, carinate dorsally in lateral aspect, with anterior margin oblique; clypeus convex, muscle impressions distinct; other characters as in *Phera*.

Thorax with lower marginal area of proepimeron not depressed, posterior portion of scutellum with or without striations; otherwise as in *Phera*. Forewing variable interspecifically, costal margin and narrow area at bases of anteapical cells always sclerotized, remainder usually hyaline, occasionally suffused with amber from wing base to base of anteapical cells, without sculpturing, claval veins fused almost throughout their length, usually separate for a very short distance at base and apex, occasionally not separate at apex; other characters as in *Phera*. Hindwing as in *Phera*. Legs with anterior tibiae very slightly dilated apically; posterior femoral setal formula 2:1:1 or 2:1:1:1; first posterior tarsomere with length almost always greater than combined

length of second and third tarsomeres; other leg characters as in *Phera*.

Male genitalia: Pygofer in lateral aspect variable, from slightly to strongly produced posteriorly, with numerous dispersed microsetae and occasionally with interspersed macrosetae, with a pair of ventral processes. Plates separate throughout their length, short, not extending as far posteriorly as pygofer apex, shape variable interspecifically, from triangular to rounded or truncate apically, usually with numerous dispersed microsetae, without macrosetae. Style variable interspecifically but never long and slender, length variable interspecifically compared to apex of connective, with or without a preapical lobe, usually rounded apically. Connective variable interspecifically, from narrow to quite broad, usually with a median keel. Aedeagus symmetrical or not, always with processes which are variable interspecifically in location. Paraphyses usually absent (present as a basal sclerite in *D. truncata*, new species).

Female abdominal sternum VII with posterior margin produced or emarginate medially.

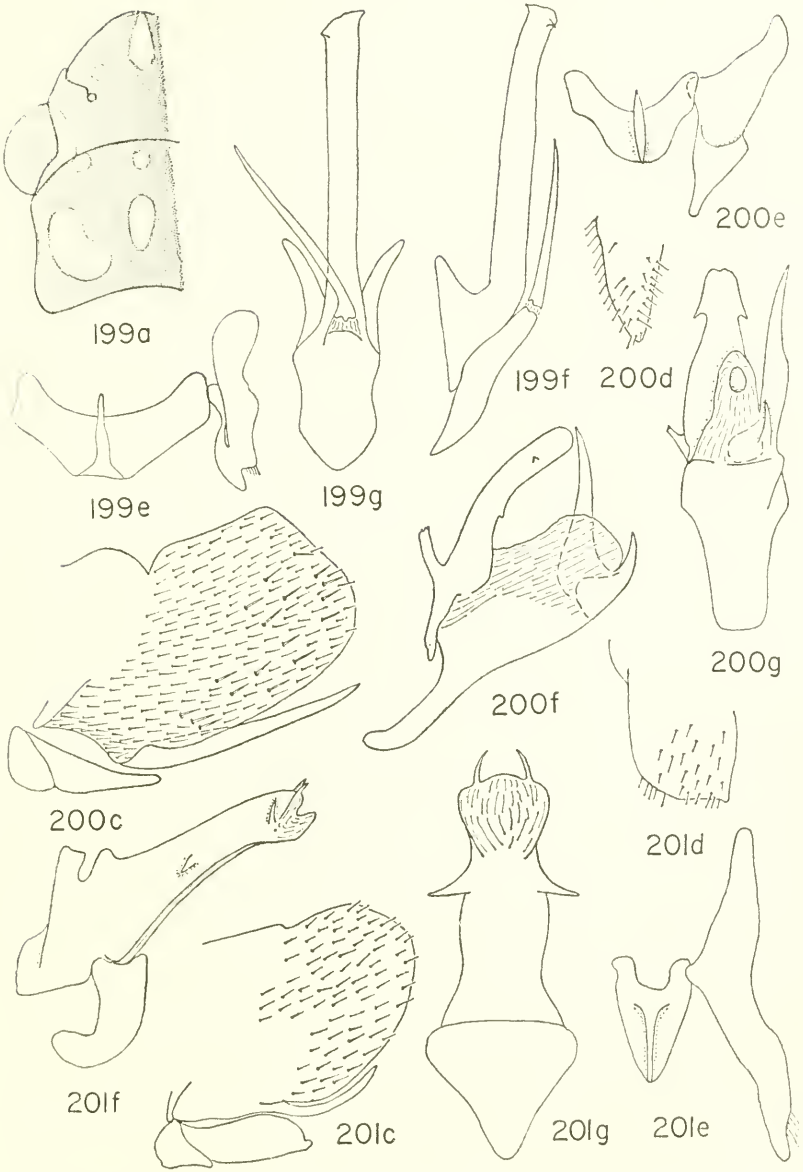
The lower limit of size in the above description is based on an undescribed species from British Guiana, of which only a single damaged female is at hand. The range of *Dichrophleps* is from the Guianas and Pará, Brazil, to Gorgona Island, Chatham Island in the Galápagos, and to Bolivia. The Galápagos record is from a single female, species unknown, in the British Museum.

Dichrophleps is very closely related to *Homalodisca*, but is readily distinguished by the much more extensively fused claval veins; by the posterior femoral setal formula, which is 2:1:0 or 2:0:0 in *Homalodisca*; by the face, which is flattened or depressed in *Homalodisca*; and by the strongly protuberant eyes, which abruptly change the contour of the sides of the head in dorsal aspect in *Dichrophleps*.

A female specimen of *Dichrophleps despecta* Melichar in the Moravian Museum is here designated lectotype. It bears labels: "Maroni/Guyane Francaise; Méaux" and "Museum Paris/R. Oberthür 1889" and "despecta M/det Melichar" and "Collectio/Dr. L. Melichar/Moravské museum Brno."

The genitalia of the lectotype male of *Dichrophleps aurea* (Fabricius) are nearly identical with figure 199, differing only slightly in that the aedeagal shaft is slightly more twisted. The genitalia of the male lectotype of *D. elongata* Melichar agree well with figure 204.

Two specimens of *Dichrophleps cingulifera* (Walker) from the British Museum were examined, one without abdomen, the other a female; both were compared with the type by Dr. W. J. Knight. The specimens are very close to *D. despecta* Melichar, and perhaps the two names are synonymous.



FIGURES 199–201.—**199,** *Dichrophleps aurea* (Fabricius), from lectotype of *D. maculata* Melichar. **200,** *D. tenebrosa*, new species, holotype. **201,** *D. truncata*, new species, holotype.

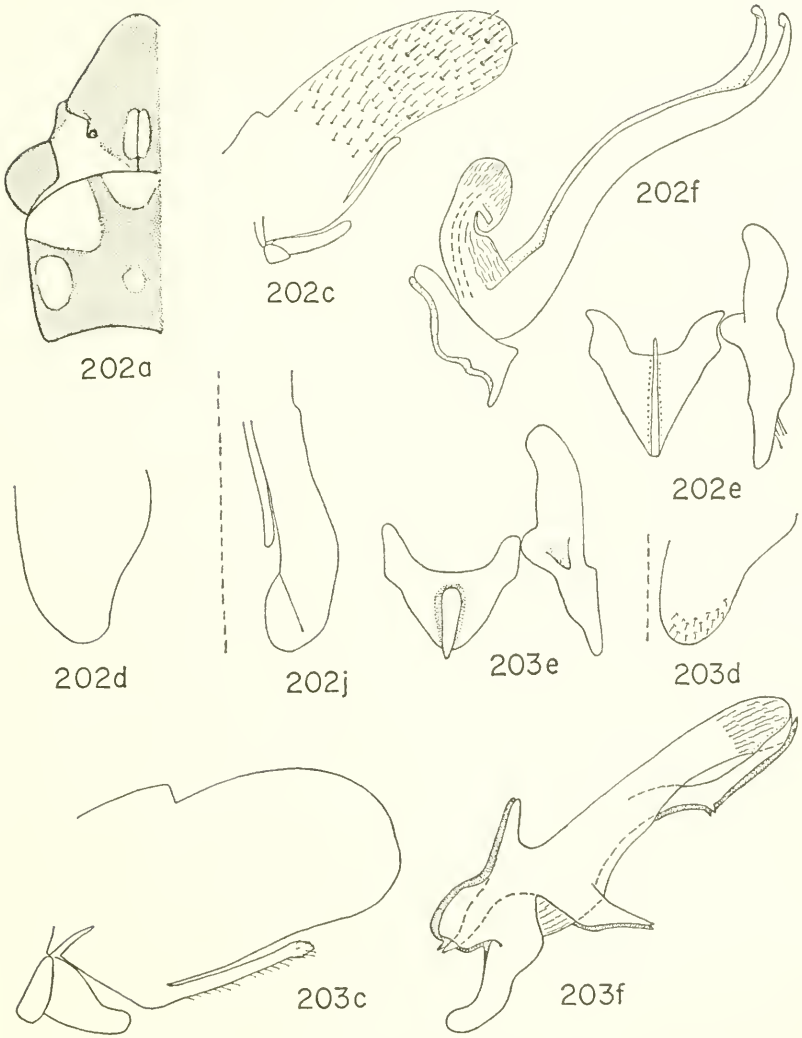
SPECIES OF DICHROPHLEPS

aurea (Fabricius), 1803a:63 (*Cicada*). Br. and Fr. Guiana.
maculata Melichar, 1925a:330. New synonymy.
boliviana Schmidt, 1928c:59. Bolivia.
cingulifera (Walker), 1858a:99 (*Proconia*).
despecta Melichar, 1925a:330. Br., D. and Fr. Guiana.
elongata Melichar, 1925a:331. D. and Fr. Guiana.
hamata, new species. NW. Brazil.
symmetrica, new species. Gorgonas Is.
tenebrosa, new species. Fr. and Br. Guiana.
truncata, new species. Peru, Bolivia.

KEY TO MALES OF DICHROPHLEPS

Not included: *D. cingulifera* (Walker).

1. Aedeagus with an unpaired ventral process which does not lie in median plane. . . . . **D. aurea** (Fabricius) (fig. 199)
   Aedeagus not as above 2
2. Pygofer processes extending posteriorly as far as apex of pygofer . 3
   Pygofer processes not extending so far posteriorly 4
3. Aedeagus symmetrical . . . . . **D. elongata** Melichar (fig. 204)
   Aedeagus asymmetrical. . . . . **D. tenebrosa**, new species
4. Male plates truncate apically; aedeagus symmetrical, with three pairs of short processes, one pair near midlength and two pairs at apex . . . . . **D. truncata**, new species (p. 217)
   Without above combination of characters 5
5. Pygofer processes elongate, slender, rounded apically 6
   Pygofer processes very short, subacute at apex 7
6. Aedeagus with a pair of very elongate processes arising at base and a pair of very short processes near apex.
   D. boliviana Schmidt (fig. 202)
   Aedeagus with a pair of short processes arising near base and a pair of longer processes arising near midlength.
   D. hamata, new species (p. 218)
7. Forewings suffused with amber before anteapical cells; crown of head without a median fovea; pygofer more strongly produced.
   D. symmetrica, new species (p. 219)
   Forewings not suffused with amber; crown of head with a median fovea on basal half; pygofer much less strongly produced.
   D. despecta Melichar (fig. 206)

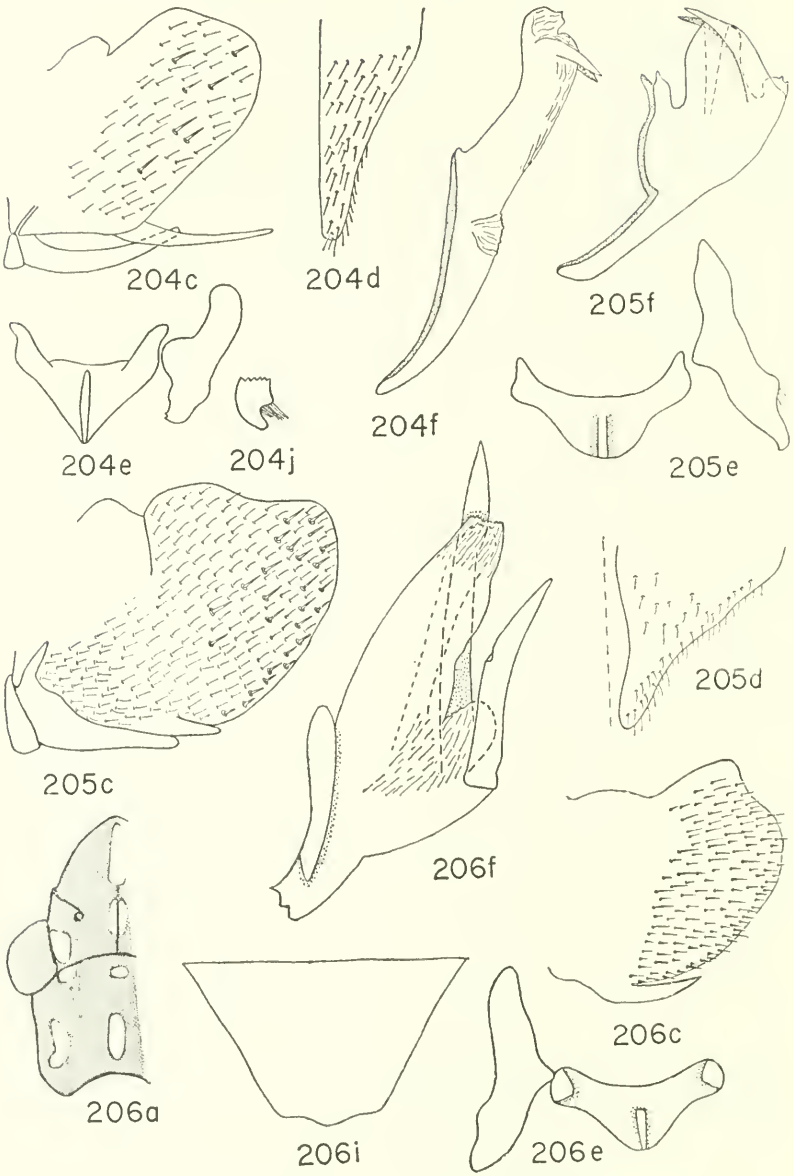


FIGURES 202, 203.—202, *Dichrophleps boliviana* Schmidt, lectotype (setae not shown in d): j, pygofer, left side, caudoventral view. 203, *D. hamata*, new species, holotype; setae on pygofer not shown in c.

Dichrophleps tenebrosa, *new species*

FIGURE 200

Length of male 15.0 mm. Head with median length of crown equal to interocular width and six-tenths transocular width, anterior margin sharply rounded in dorsal aspect, ocelli located slightly before a line



FIGURES 204–206.—**204,** *Dichrophleps elongata* Melichar, specimen from Surinam: **j,** style apex, broad aspect. **205,** *D. symmetrica,* new species, holotype. **206,** *D. despecta* Melichar: **a-f** from specimen from British Guiana; **i,** from Surinam.

between anterior eye angles, each equidistant from latter and median line, with a slight M-shaped elevation bordering posterior margin, with a partial median fovea extending from posterior margin anteriorly about half length of crown. Thorax with posterior portion of scutellum weakly transversely striate. Forewings hyaline, not suffused with amber, claval veins separate posteriorly. Hindlegs with length of first tarsomere greater than combined length of second and third. Male pygofer in lateral aspect strongly produced and with posterior margin broadly rounded, with numerous evenly dispersed microsetae over most of surface and with a few interspersed macrosetae, ventral process very long and slender, acute apically, extending as far posteriorly as posterior pygofer margin; plates very short, separate throughout their length, each triangular, sharply rounded at apex, with a number of microsetae located mostly along mesal and lateral margins; style short, extending farther posteriorly than apex of connective, with a weak preapical lobe, apex narrowly rounded; connective shallowly U-shaped, the arms moderately divergent, with a median carina, aedeagus asymmetrical, with a large dorsal process bearing a pair of much smaller processes near its apex, and with a pair of ventral shaft processes which are asymmetrical in form and location; paraphyses absent. Other structural characters as in generic description. Female unknown. Color of anterior dorsum tan (type) to black, with or without (type) a median dull yellow spot on crown; face yellow (type) or gray; thoracic venter and pleura tan (type) or gray.

Holotype male, Maroni River, French Guiana, on indefinite loan to USNM from NCS; one additional male, New River, British Guiana (BM) and a female from French Guiana (ZIMH).

This species is closely related to *D. despecta* Melichar, but differs in its lack of spots on crown and pronotum, in the shape of the connective, and especially in the form of the pygofer and the length of the pygofer processes, both of which are longer than in *D. despecta*.

Dichrophleps truncata, *new species*

FIGURE 201

Length of male 14.0 mm. Head with crown more broadly rounded anteriorly in dorsal aspect than in *D. tenebrosa*, new species, ocelli each slightly closer to adjacent anterior eye angle than to median line. Forewings hyaline suffused with amber, claval vein with posterior fork occurring more basally than in *tenebrosa*, and giving off a few supernumerary crossveins which extend mesally and do not attain commissural margin. Hindlegs with femoral setal formula 2:1:1, first tarsomere with length greater than combined length of second and third. Male pygofer in

lateral aspect moderately produced, with posterior margin broadly rounded, with numerous dispersed microsetae on posterior half of disc, processes slender and elongate but not extending as far posteriorly as posterior pygofer margin; plates each truncate apically and with few dispersed microsetae on posterior half; style longer and more slender than usual in the genus, with a weak preapical lobe; aedeagus symmetrical, with three pairs of short processes, one pair near midlength of shaft and two pairs at shaft apex; paraphyses occurring as a single median reduced sclerite. Other structural characters as in *tenebrosa*. Female unknown. Color of anterior dorsum dull yellow with weak fuscous markings poorly delimiting several areas on crown of head, three spots in a transverse row on disc of pronotum, the basal angles, a median basal spot and a pair of spots behind transverse sulcus of scutellum; face sordid yellow with a transverse area on clypeus and a median longitudinal area on clypeus and clypellus, black.

Holotype male, Hacienda María, Cuzco, Peru, Feb. 26, 1952 (F. L. Woytkowski), Río Cosñipata, 900 m., on indefinite loan to USNM from NCS; sixteen additional topotypic specimens and three specimens, Río Huallaga Valley, Huanuco, Prov., Peru, February (NCS); one male from an unknown Bolivian locality (HNHM); and one male, Río Monzón Valley, Peru, October (CAS).

This species differs from all others in the genus in the truncate male plates and in the occurrence of an unpaired basal plate between the connective and aedeagus, which must be considered as a homologue of paraphyses, although in consideration of the other species in the genus there seems no doubt that it has arisen secondarily.

Dichrophleps hamata, *new species*

FIGURE 203

Length of male 16.5 mm. Head with ocelli each slightly closer to adjacent anterior eye angle than to median line. Thorax with posterior portion of scutellum very obscurely striate. Forewings suffused with amber, translucent, with the membrane including apical cells and apical portion of inner two anteapical cells, claval vein with posterior fork occurring more basally than in *D. tenebrosa*, new species, and with a short crossvein extending towards commissural margin opposite scutellar apex. Hindlegs with femoral setal formula 2:1:1:1. Male pygofer with ventral processes slender and elongate, each rounded apically and bearing a number of small microsetae, not extending as far posteriorly as posterior pygofer margin; plates broadly rounded apically, each with a few anteapical very small microsetae; style extending approximately as far posteriorly as apex of connective, with-

out preapical lobe; aedeagus symmetrical, a pair of conspicuous ventral processes arising near base and a pair of longer ventral processes arising near midlength and extending as far as apex of shaft, each of latter with a ventral angulate short projection in basal half; paraphyses absent. Other structural characters as in *D. tenebrosa*. Female unknown. Color of crown and scutellum dull yellow, of pronotum castaneous, face yellow except a dark area at apex of clypellus.

Holotype male, "Tonantins," Amazonas, Brazil (RMS).

This species is very closely related to *D. boliviana* Schmidt, but differs conspicuously in the structure of the aedeagus (see fig. 202).

Dichrophleps symmetrica, *new species*

FIGURE 205

Length of male 16.6 mm.; of female 17.7 mm. Head with median length of crown approximately equal to interocular width and approximately six-tenths transocular width, anterior margin sharply rounded in dorsal aspect, ocelli located on a line between anterior eye angles and each slightly closer to median line than to adjacent eye angle, without an M-shaped elevation bordering posterior margin, median line impressed but not foveate. Thorax with posterior portion of scutellum not striate. Forewings suffused with amber except claval apex, apex of brachial cell, apices of inner two anteapical cells and the apical cells, all of which are hyaline; claval vein branched at a point very near its apex. Hindlegs with femoral setal formula 2:1:1. Male pygofer with ventral processes very short, each sharply rounded apically, not extending posteriorly nearly as far as posterior pygofer margin; style with a slight mesal angle at apex; aedeagus symmetrical, with a pair of ventral shaft processes extending beyond apex of shaft; paraphyses absent. Other structural characters as in *D. tenebrosa*, new species (except posterior tarsomeres, which were not observed). Color of anterior dorsum rich brown, with three median spots, a spot before each ocellus, a spot bordering each inner eye margin on crown, three submarginal spots along anterior margin and three spots across disc of pronotum, a spot in each basal angle, a median basal spot, a pair of spots behind transverse sulcus and the extreme tip of scutellum, yellow; face and venter pale yellow, pleural region deeper yellow, the metepimeron dark-margined posteriorly and dorsally.

Holotype male, Gorgonas Island, lat. 2°59′ N., long. 78°20′ W., July 1924 (L. E. Cheesman), and two topotypic females (BM).

This species is closely related to *D. tenebrosa*, from which it may readily be distinguished by its symmetrical aedeagus and the distinct markings of the anterior dorsum.

47. Genus ONCOMETOPIA Stål, *sensu lato*

FIGURES 207–219

Oncometopia Stål, 1869a:62. Type-species: *Cicada undata* Fabricius, preoccupied, =*Cicada orbona* Fabricius, by subsequent designation of Distant, 1908b:62.

Parametopia Melichar, 1925a:387, preoccupied. Type-species: *Cicada orbona* Fabricius, by subsequent designation of Schmidt, 1928c:71.

Lebora China, 1927d:283, as new name for *Parametopia* Melichar.

Length 9.4–15.0 mm.

Head moderately produced, its median length almost always less than interocular width, anterior margin rounded in dorsal aspect, crown rounded to face without a carina between the two, ocelli each about equidistant from median line of crown and adjacent anterior eye angle or slightly closer to latter, without an M-shaped elevation bordering posterior margin, disc without a median fovea, usually with short sparse pubescence; antennal ledges each with longitudinal fovea, each carinate dorsally, with anterior margins oblique; clypeus strongly convex, not flattened nor concave medially (exception: female of *O. fuscipennis* Fowler), with dorsomedial surface texture coarsely granular; other head characters as in *Phera*.

Thorax with pronotal disc punctate and usually rugose, with or without pubescence; proepimeron with lower marginal area not depressed and with width of proepimeron greater than length; posterior portion of scutellum almost always without transverse striae; other thoracic characters as in *Phera*. Forewing coriaceous, with an apical membrane (sometimes very narrow), veins distinct, surface often punctate, claval veins parallel, approximate, contiguous, or fused near their midlength, otherwise as in *Phera*. Hindwing as in *Phera* (exception: *O.* (*Similitopia*) *alpha*, see p. 230). Anterior tibiae not or only slightly dilated apically. Hindlegs with first tarsomere variable in length, shorter than, equal to, or longer than combined length of second and third posterior tarsomeres, otherwise as in *Phera*.

Male genitalia: Pygofer in lateral aspect usually short and broad, with numerous dispersed microsetae and occasionally with interspersed macrosetae, almost always with at least vestigial processes arising on ventral margin, and occasionally with additional process-like (but usually not differentially sclerotized) extensions which are dorsoapical or apical in origin. Plates as in *Phera*. Style extending as far as or farther posteriorly than connective or not, with or without a distinct preapical lobe, from rounded to angulate or truncate at apex. Connective broad, widely separating styles, Y-, T-, or U-shaped, keeled medially. Aedeagus quite variable interspecifically and in some species intraspecifically, always rather large, frequently with processes which may or may not be symmetrically arranged. Paraphyses absent.

Female abdominal sternum VII in most species with a median concavity on posterior margin, the concavity bearing a slight median convexity (see fig. 208i), occasionally with posterior margin almost rectilinear, or slightly produced and truncate.

The known range of *Oncometopia*, s.l., extends from northern United States to Brazil, Argentina, and Bolivia. The genus is most closely related to *Homalodisca*, from which it is readily separable by its inflated clypeus and by its granulations between the muscle impressions of each side of the clypeus, both of which conditions differ from *Homalodisca*.

Oncometopia contains the largest number of species of any genus in the Proconiini, and some are of considerable economic importance. *Oncometopia orbona* (Fabricius) is an important vector of Phony Peach Disease in southern United States, and Turner and Pollard (1959a) have published much information on its biology. *O. clarior* (Walker) has been submitted to the U.S. Department of Agriculture, Division of Insect Identification, from Citrus, and from *Lantana camara* Linnaeus from Mexico; specimens in the University of California were collected from Cucurbita in Mexico; and *O. rubescens* Fowler, intercepted on bananas, was frequently submitted to me at the same agency. *O. parallela* (Walker) was submitted from *Verbesina turbacensis* HBK from Venezuela, *O. herpes* (Signoret) from *Lantana camara*, and *O. costaica* Schröder from *Pennisetum purpureum* Schumacher. *O. fuscipennis* Fowler has been collected on *Eupatorium* (*adenophorum*)=*glandulosum* Michaux in Mexico by N. L. H. Krauss. *O. rufipennis* (Signoret) has been collected on *Lantana camara* in Mexico by J. Mann; and an undescribed species in the subgenus *Similitopia*, in numbers, from lettuce, in Mexico.

It should be noted that, of the species with an asymmetrical aedeagus, it is often found that the aedeagus of one specimen will be a mirror image of another.

While the present work was in its early stages, Dr. Heinz Schröder, of the Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt-am-Main, Germany, independently began a detailed study of *Oncometopia*. He was of much assistance to me in identifying species of this genus during my visit to the Senckenberg Museum in 1962. He continues to work in this genus, hence construction of a key and descriptions of new species are not included here in deference to his study. A number of the types in this genus have not been studied by me but are included in the check list on the basis of Schröder's published work. More than 20 species which appear to be hitherto undescribed have been taken into account in the foregoing generic description. There remains only to set forth a few remarks on the North American species, the result of my studies in 1953 and 1954, a few remarks to

validate lectotypes recently selected by me, and a check list of the described species.

ONCOMETOPIA, *sensu stricto*

FIGURES 207–215

(See generic heading, p. 220, for synonymy.)

Species as in the description for *Oncometopia*, Stål, s.l., above, and with the tenth abdominal segment (base of anal tube) of the male not modified to form conspicuous large lobes. Geographic distribution as in generic description.

The common widespread North American species of *Oncometopia*, s.s., is *orbona* (Fabricius). As with a number of other species, it has a considerable range of variation in the form of the aedeagus (fig. 207). This species extends from north-central and northeastern United States to the Gulf Coast in its western range and to the region of the Okefenokee Swamp in the eastern part of its range. A second species occurs throughout Florida, except in the extreme northern portion; the aedeagus of this species is illustrated in figure 211. This Florida species agrees with *O. nigricans* (Walker), of which I have examined the type. Differences between these two forms were also found in sclerites in the female genital chamber (figs. 208j and 210), which Nielson (1965a) interprets as sternal elements of abdominal sternum VIII (the sclerotization of the female genital chamber of *O. nigricans* (Walker) is like the illustration (fig. 210) of *O. clarior* (Walker)). Dr. W. F. Turner, upon learning of these differences through correspondence with me, collected a form now known to occur in northern Florida and southern Georgia, which is intermediate in both male and female characters (fig. 209). Dr. Turner tried crosses between the northern and southern forms, but none with the intermediate forms. The attempts were unsuccessful. My assessment of the status of the forms is that three species are involved: *O. orbona* (Fabricius) in northern and north central United States, *O. nigricans* (Walker) in Florida and southern Georgia, and an unnamed species in northern Florida and in southern Georgia; although there is a possibility that a step-cline is involved and that all three forms belong to the same species. Cross-breeding experiments between the northern and intermediate and between the southern and intermediate forms are needed to solve this problem. It will be noted that the present interpretation of the Florida species does not agree with that of Schröder (1959a:17) who illustrated, as *nigricans*, the aedeagus of a species of which I have examined specimens from Victoria, Texas, from Vera Cruz, Mexico, and from Guatemala, but not from Florida.

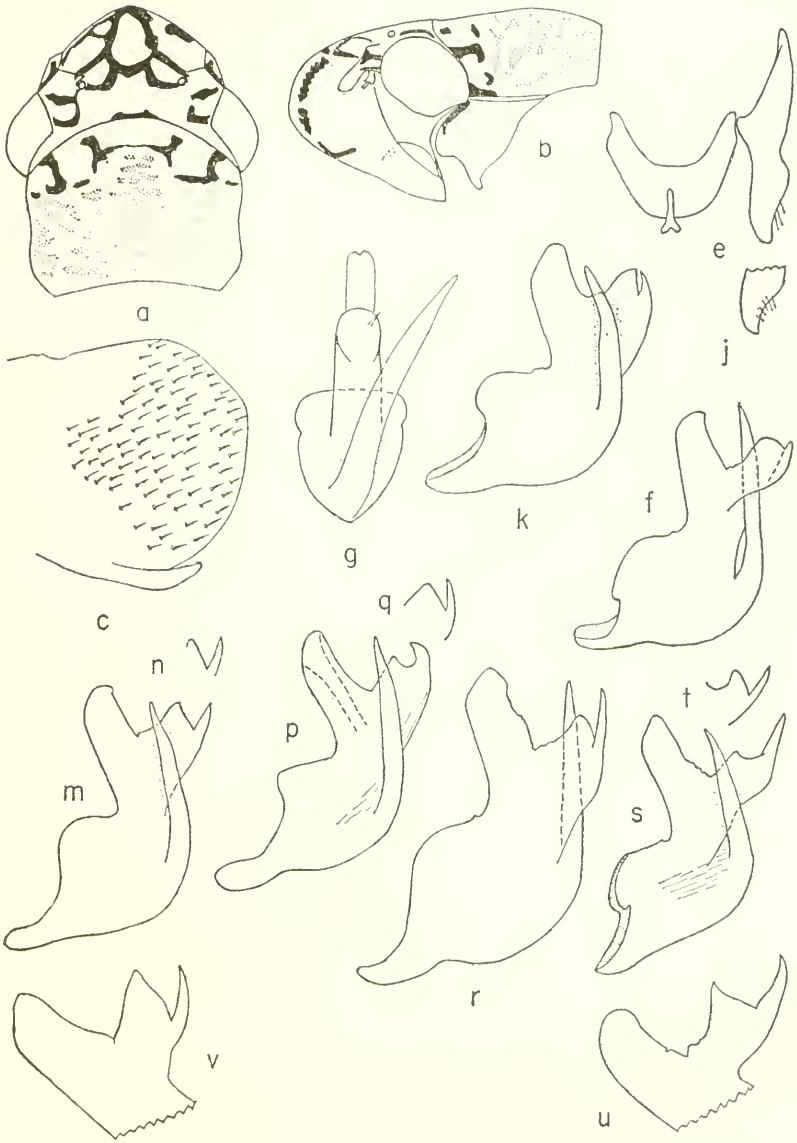
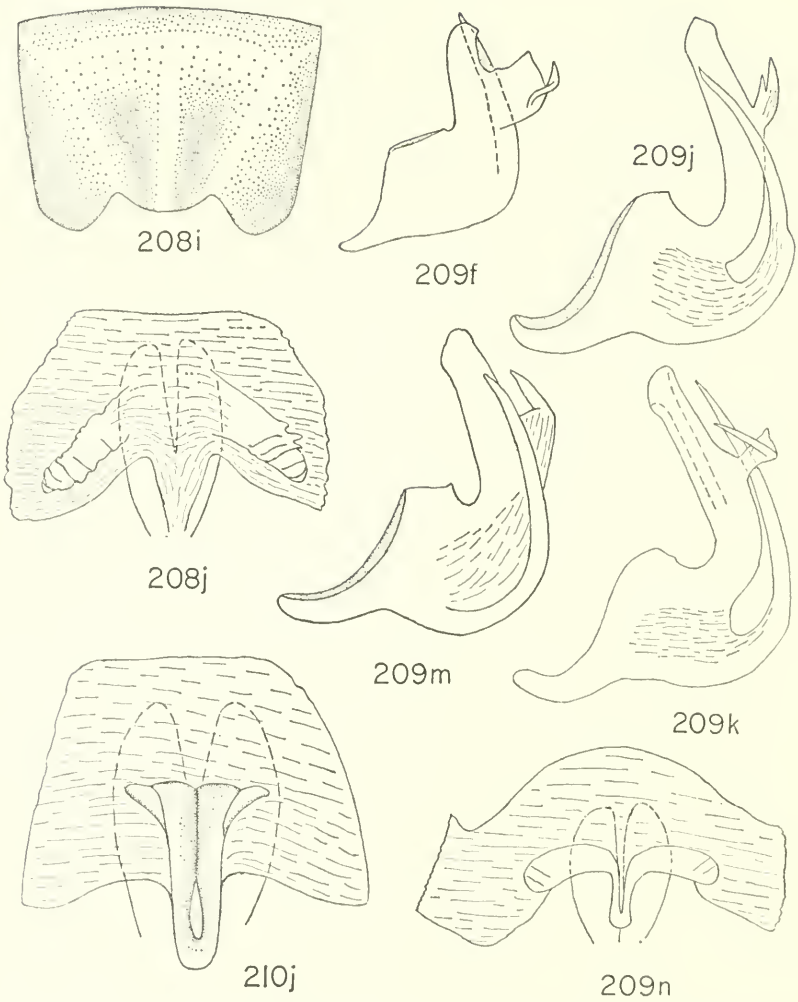
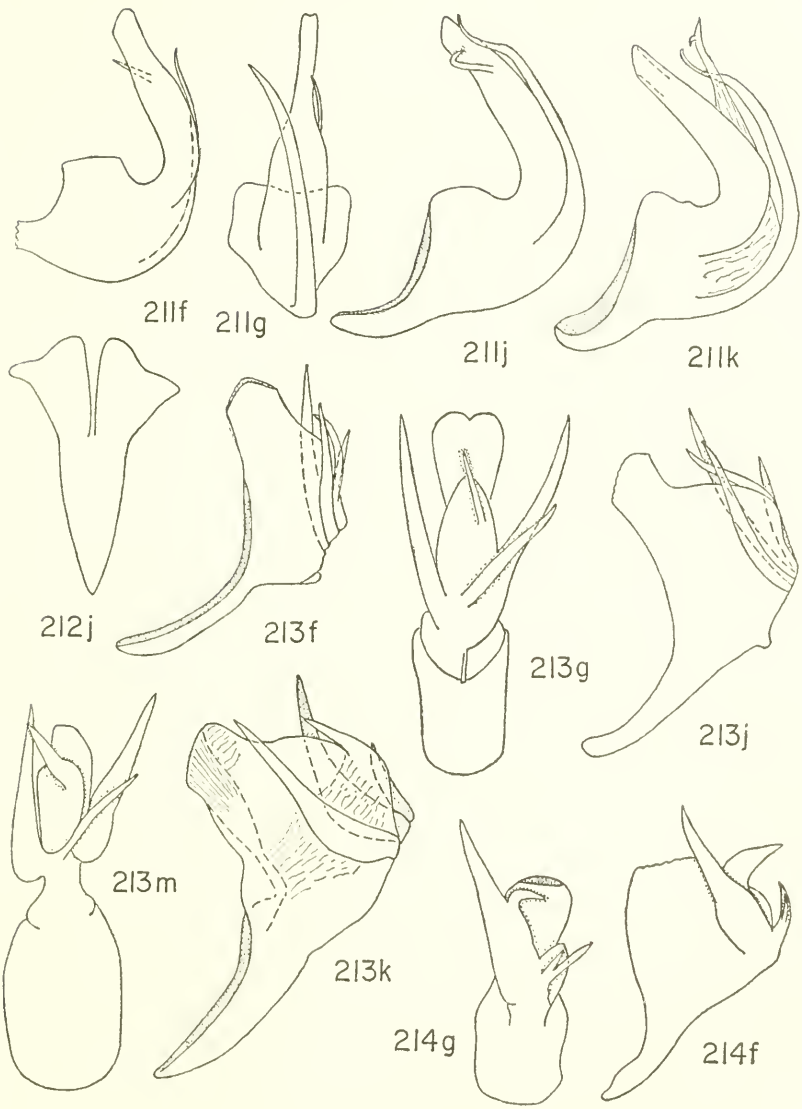


FIGURE 207.—*Oncometopia orbona* (Fabricius) (**a-c, e, j** from specimens from Dublin, Georgia; **f** and **g**, from Thomasville, Alabama; **k, q, t**, from Hamilton Co., Tennessee; **m** and **p**, from Plummer's Island, Maryland; **n**, from Ziegler, Illinois; **r**, from Helena, Arkansas; **s**, from Chanute, Illinois; **u** and **v**, from Fort Valley, Georgia): **j**, style apex, lateral view; **k-v**, aedeagus, lateral view (apex only in **u** and **v**); posterior portion of apex only in **n, q,** and **t**).



FIGURES 208–210.—**208**, *Oncometopia orbona* (Fabricius) (**i** from specimen from Lake Drummond, Virginia; **j**, from Opelousas, Louisiana): **j**, membrane of genital chamber of female, with sclerites. **209**, *Oncometopia* sp. (**f** from specimen from Georgia; **j**, **k**, **n**, from Homerville, Georgia; **m** from Jacksonville, Florida): **j**, **k**, **m**, aedeagus in lateral view; **n**, membrane of genital chamber of female, with sclerites. **210**, *O. clarior* (Walker), specimen from Brownsville, Texas: **j**, membrane of genital chamber of female, with sclerite.



FIGURES 211–214.—**211**, *Oncometopia nigricans* (Walker) (**f** and **g** from specimen from Florida; **j**, from Big Pine Key, Florida; **k**, from Lemora City, Florida): **j** and **k**, aedeagus, lateral view. **212**, *O. badia* (Walker), lectotype: **j**, sclerotization of genital chamber. **213**, *O. rubescens* Fowler (**f** and **g** from specimen from Barro Colorado Island, Panama; **j**, from Ecuador (from bananas); **k** and **m**, from Brazil): **j** and **k**, aedeagus in lateral view; **m**, aedeagus in caudoventral view; **214**, *O. parallela* (Walker), specimen from Venezuela.

Oncometopia tomentosa Distant belongs in the genus *Tretogonia* (see p. 167) and is not conspecific with *O. asperula* Melichar as stated by Schröder (1959a:25). The holotype of *O. badia* (Walker) is a female, of which the sclerotization of genital chamber is illustrated in figure 212. The lectotype of *O. clarior* (Walker) agrees with Schröder's interpretation (1959a:16). The lectotype of *O. coacta* Schmidt is conspecific with the lectotype of *O. rubescens* Fowler. The male genitalia of the lectotype of *O. dispar* Fowler are very similar to those of the holotype of *O. parallela* (Walker), which are illustrated in figure 214. The lectotype of *O. facialis* (Signoret) is a specimen which Schröder had studied. The abdominal sternum VII of the lectotype of *O. funebris* (Signoret) agrees with Schröder's (1959a:pl.1) illustration. The synonymy for *O. nigricans* (Walker) in the check-list below is based on a study of the male genitalia of the lectotype of *O. nigricans*, of the holotypes of *O. marginata* (Walker) and *O. scutellata* (Walker), and a gross comparison of the female holotype of *O. tenebrosa* (Walker). The lectotype of *O. obtusa* (Fabricius) had been studied by Schröder and it agrees with his (1959a:pl.1) illustration. Schröder had studied earlier the specimen selected as lectotype of *O. orbona* (Fabricius) and it fits his (1959a:14) interpretation of the species. *O. plagiata* (Walker) is placed in synonymy under *O. orbona* (Fabricius) as a result of study of the genital chamber of the female holotype of *plagiata*. The lectotype of *O. rubiginosa* (Signoret) agrees with Schröder's (1959a:pl.4) illustration. The genitalia of the lectotype of *O. tartarea* (Stål) are illustrated here (fig. 215). The lectotype of *O. undata* (Fabricius), a female, appears to be conspecific with the lectotype of *O. orbona* (Fabricius).

SPECIES OF ONCOMETOPIA, SENSU STRICTO

[Localities are those from which I have seen specimens. See Schröder's work for additional records.]

asperula Melichar, 1925a:378. Ecuador.
azteca Schröder, 1959a:33. S. Mexico, Guatemala.
badia (Walker), 1851b:786 (*Proconia*). Locality unknown.
brunnescens Schröder, 1959a:30. El Salvador.
capricornis Schröder, 1960a:97. Costa Rica, Panama.
caucaensis Schröder, 1960b:316. Colombia, Venezuela.
clarior (Walker), 1851b:784 (*Proconia*). Mexico, Guatemala, Honduras, El Salvador, Costa Rica, Panama, Colombia, Brazil.
viridula Melichar, 1925a:384 (fide Schröder).
cordata Melichar, 1925a:376. Brazil.
costaica Schröder, 1960a:100. Costa Rica, Panama.
curvidens Schröder, 1959a:29. El Salvador.
discophora Schröder, 1962a:157. S. Mexico.
dispar Fowler, 1899b:229. Guatemala.

facialis (Signoret), 1854c:489 (*Tettigonia*). Colombia, Ecuador, Bolivia, Brazil, Paraguay.

expansa Melichar, 1925a:377 (fide Schröder).

flava (Signoret), 1855d:799 (*Tettigonia*).

flavicollis (Signoret), 1853b:350 (*Tettigonia*). Brazil.

funebris (Signoret), 1854c:490 (*Tettigonia*). Mexico.

fusca Melichar, 1925a:374. SE. Brazil.

var. *santosa* Schröder, 1962a:160.

hamata Melichar, 1925a:378.

herpes (Signoret), 1855d:796 (*Tettigonia*). S. Mexico, Colombia, Brazil (?).

interjecta Fowler, 1899b:228. Panama.

kliefothi Schröder, 1960a:98. Costa Rica.

lineatifrons Melichar, 1925a:376. Ecuador.

maya Schröder, 1962a:156.

melichari Schröder, 1959a:21. Colombia, Venezuela.

meridensis Schröder, 1959a:27. Colombia, Venezuela.

mexicana Schröder, 1959a:32.

nigerrima Schröder, 1960b:318. Guatemala.

nigricans (Walker), 1851b:783 (*Proconia*). Florida.

marginata (Walker), 1851b:785 (*Proconia*).

scutellata (Walker), 1851b:786 (*Proconia*).

tenebrosa (Walker), 1851b:787 (*Proconia*).

obtusa (Fabricius), 1787a:269 (*Cicada*). Colombia, Venezuela, Trinidad Is., D. Guiana.

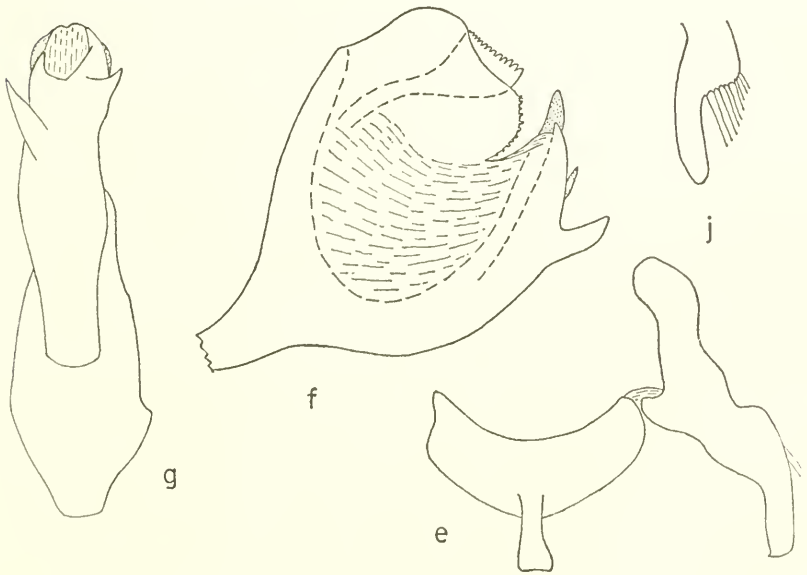
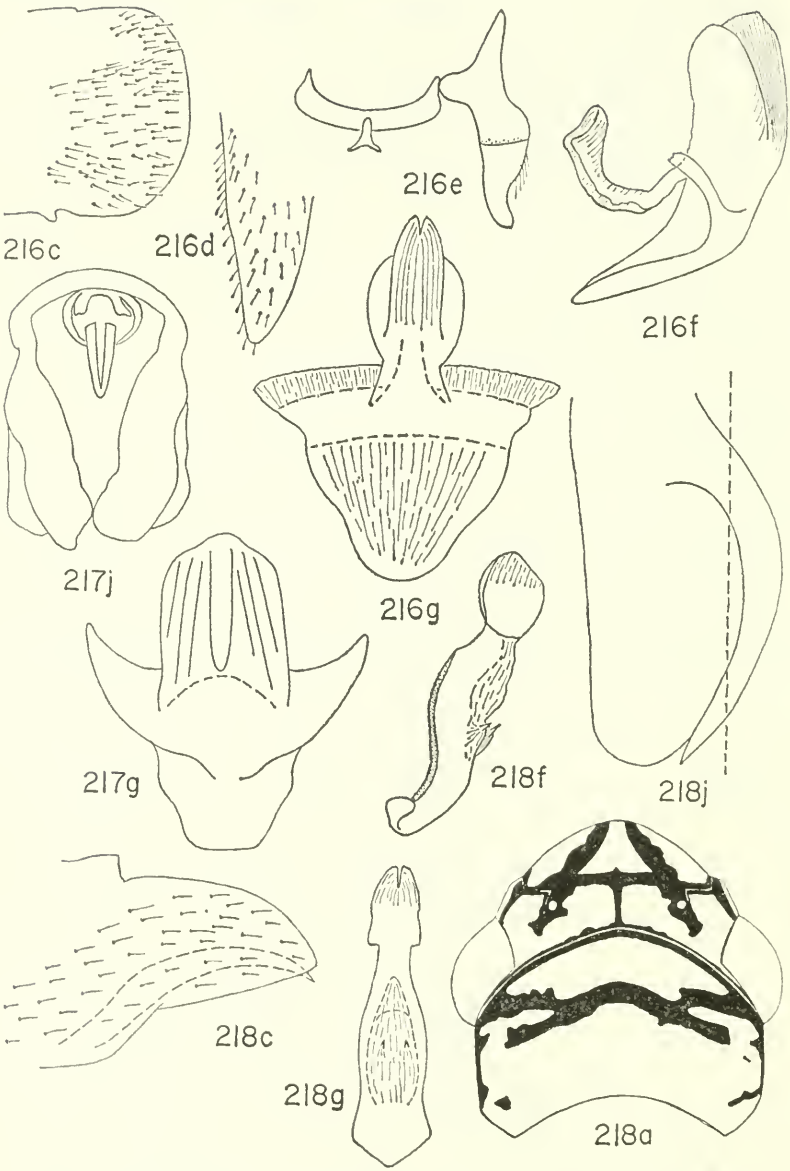


FIGURE 215.—*Oncometopia tartarea* (Stål), lectotype.



FIGURES 216–218.—**216,** *Oncometopia* (*Similitopia*) *fuscipennis* Fowler, specimen from Cuernavaca, Mexico, plate not shown in **c**. **217,** *O.* (*S.*) *rufipennis* (Signoret), specimen from Acapulco, Mexico: **j,** anal tube, dorsal view. **218,** *O.* (*S.*) *alpha* Fowler, specimen from Granite Dells, Arizona (plate not shown in **c**): **j,** pygofer, right side in ventral view.

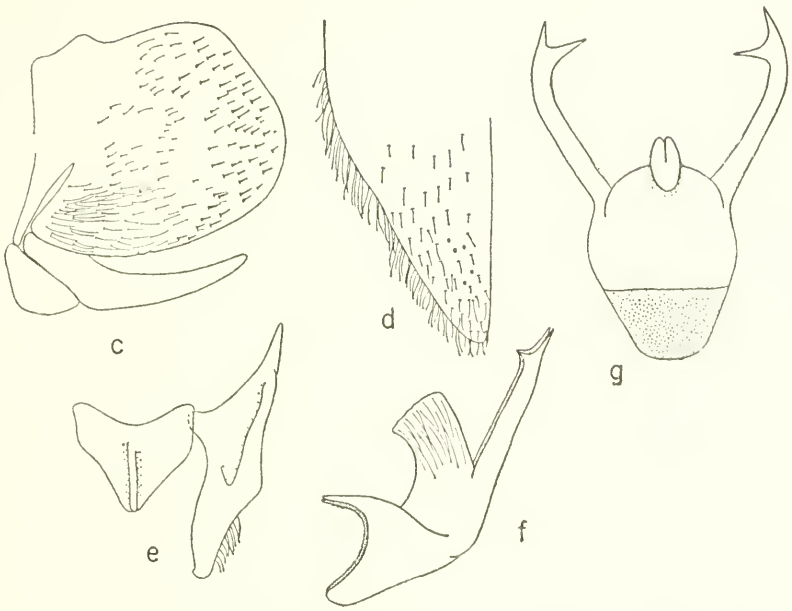


FIGURE 219.—*Oncometopia* (*Similitopia*) *quadrinotata* Fowler, specimen from Hermosio, Mexico.

orbona (Fabricius), 1798a:520 (*Cicada*). E., S. and Central U.S.A.
undata (Fabricius), 1794a:32 (*Cicada*), preoccupied.
plagiata (Walker), 1851b:788 (*Proconia*).
parallela (Walker), 1851b:788 (*Proconia*). Colombia, Venezuela.
scutellaris Melichar, 1925a:374.
pseudobtusa Schröder, 1959a:18. Mexico.
resistens Melichar, 1925a:384.
rubescens Fowler, 1899c:233. Costa Rica, Panama, Colombia, Brazil, Venezuela, Ecuador.
coacta Schmidt, 1928c:70. New synonymy.
ochracea Schröder, 1959a:23. New synonymy.
rubiginosa (Signoret), 1854c:491 (*Tettigonia*). Mexico.
salvadorensis Schröder, 1959a:31. El Salvador.
semilunata Schröder, 1959a:30. El Salvador.
subcordata Schröder, 1962a:158. D. Guiana.
tartarea (Stål), 1864a:78 (*Phera*). Mexico.
tolteca Schröder, 1962a:156. S. Mexico.
trilobata Melichar, 1925a:377.
tucumana Schröder, 1959a:28. N. Argentina.
venata Schröder, 1959a:22.
venosula Distant, 1908b:64. Ecuador, Peru.

ONCOMETOPIA *subgenus* SIMILITOPIA Schröder, *new status*

FIGURES 216–219

Similitopia Schröder, 1959a:45. Type-species: *Oncometopia fuscipennis* Fowler, by original designation.

Characters as in generic description (pp. 220–222), and with tenth abdominal segment (basal segment of anal tube) of male modified to form a pair of conspicuous, large lobes. Geographic distribution Mexico and Arizona.

Species in this subgenus frequently have an A-shaped dark marking on the crown of the head, but this occurs also in the nominate subgenus. The aedeagus is symmetrical, with or without processes. The type-species is unique in the subgenus in that the posterior pronotal margin is convex. *O. alpha* Fowler is peculiar in that vein R_{2+3} of the hindwing is entire.

An examination of Schröder's lectotype of *O. rufipennis* (Signoret) and of the lectotype of *O. fuscipennis* Fowler resulted in the removal of the latter from synonymy under the former. A study of the male genitalia of the lectotype of *O. oaxacae* Fowler resulted in its being synonymized, below. The male genitalia of the lectotype of *O. alpha* Fowler are as illustrated in figure 218, except that the aedeagus is without the two minute processes. The genitalia of a male specimen, compared with female lectotype of *O. quadrinotata* Fowler are as illustrated in figure 219, except that only one of the aedeagal processes is branched.

According to Ball, *O. alpha* Fowler feeds on pine.

SPECIES OF ONCOMETOPIA (SIMILITOPIA)

alpha Fowler, 1899b:232. Arizona, Mexico.
fuscipennis Fowler, 1899b:230. Central and S. Mexico.
miniatipennis Fowler, 1899b:231. Central Mexico.
quadrinotata Fowler, 1899b:230. N.W and W. Mexico.
rufipennis (Signoret), 1855d:797 (*Tettigonia*). Central and S. Mexico.
oaxacae Fowler, 1899c:234. New synonymy.

48. Genus HYOGONIA China

FIGURE 220

Heterometopia Melichar, 1925a:386, preoccupied. Type-species: *Oncometopia reticulata* Melichar (1925a:386), by original designation and monotypy.
Hyogonia China, 1927d:283, as new name for *Heterometopia* Melichar.

Length of male 13.4 mm.

Head strongly produced, its median length about three-fourths its interocular width and less than half its transocular width, anterior

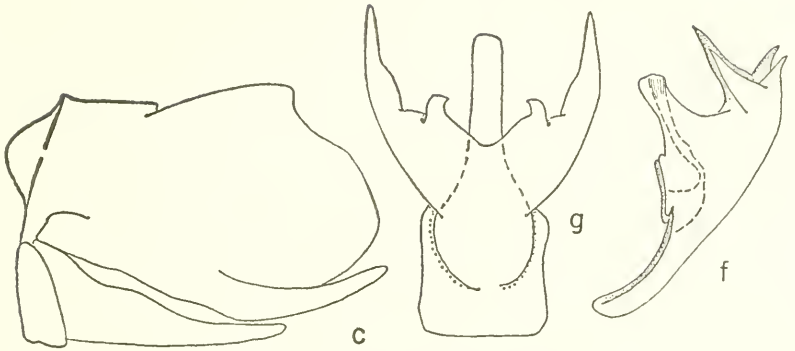


FIGURE 220.—*Hyogonia reticulata* (Melichar), specimen from Bolivia; setae not shown in c.

margin in dorsal aspect very broadly rounded, without a carina at transition from crown to face, each ocellus slightly closer to adjacent anterior eye angle than to median line, without an M-shaped elevation bordering posterior margin, disc convex, without a median fovea, with short sparse pubescence; antennal ledges with anterior margins not declivous; clypeus inflated, without granulations on dorsomedian area, other head characters as in *Phera*.

Thorax with lateral pronotal margins divergent anteriorly, pronotal disc punctate and rugose, with very short pubescence; proepimeron with lower marginal area not depressed, width greater than length; posterior portion of scutellum transversely striate. Forewing with membrane including anteapical and apical cells, apex of brachial cell and adjoining clavus semimembranous, remainder of surface strongly coriaceous and with numerous crossveins, middle anteapical cell with supernumerary crossveins; claval veins not fused; other characters as in *Phera*. Hindwing with vein R_{2+3} complete but weak apically, other characters as in *Phera*. Hindlegs with femoral setal formula 2:0:0; first tarsomere with length approximately equal to combined length of second and third tarsomeres.

Male genitalia: Pygofer in lateral aspect strongly produced, broad, with a slight dorsoapical concavity on posterior margin, disc with numerous, dispersed, elongate microsetae, with a ventral process extending to apex of posterior margin. Plates with numerous dispersed microsetae, more numerous along lateral margins, otherwise as in *Phera*. Style extending posteriorly almost to apex of connective, with a slight preapical lobe, rounded apically. Connective as in *Phera*. Aedeagus symmetrical with symmetrical branched ventral processes. Paraphyses absent.

Hyogonia is known only from the type-species, which occurs in Venezuela, Brazil, Peru, and Bolivia. It is closely related to *Oncometopia* from which it differs in its reticulate-veined forewings, its lack of dorsomedian granulations on the clypeus, its more produced male pygofer and the distinctly striated posterior portion of the scutellum. The head is more broadly produced than in *Oncometopia*, with the anterior margin more broadly curved. Schröder (1959a:43) indicated that he had seen the type of the type-species, but no lectotype was found in any of the European collections visited by me. The present interpretation of *H. reticulata* (Melichar) is based on a male specimen determined by Melichar in HNHM which varied slightly from the accompanying illustration in that the pygofer is shorter and the more dorsal of the aedeagal processes are slightly longer.

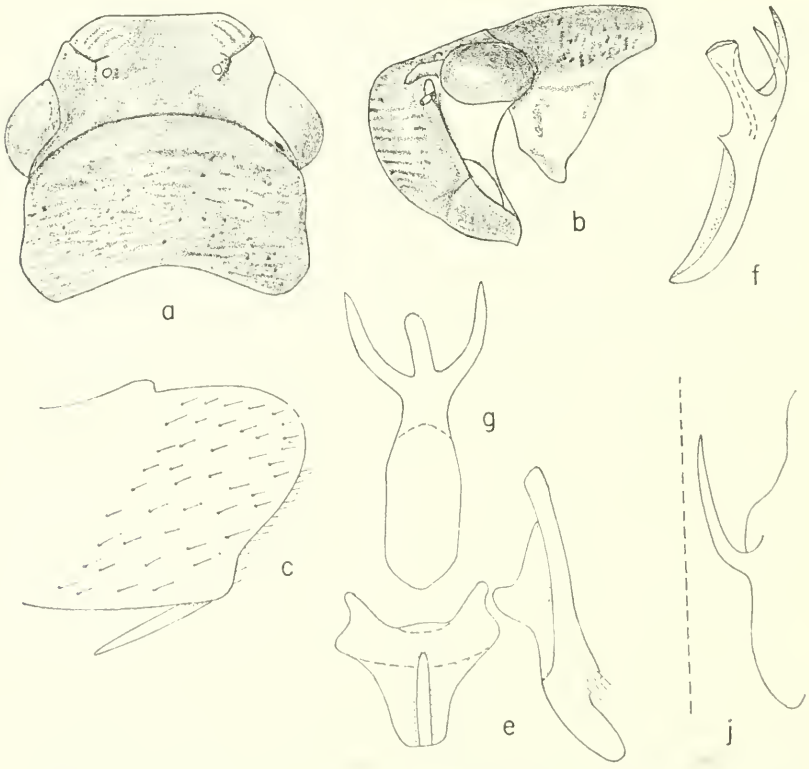


FIGURE 221.—*Quichira tegminis*, new species, holotype (plate not shown in c): j, pygofer, left side in ventral view.

49. QUICHIRA, *new genus*

FIGURE 221

Type-species: *Quichira tegminis*, new species.

Length 10.3 mm.

Head moderately produced and truncate apically in dorsal aspect, median length of crown less than half interocular width and more than one-third transocular width, anterior margin subangulate near middle at transition from crown to face, ocelli located before a line between anterior eye angles, each slightly closer to median line than to adjacent eye angle, surface of crown concave except for an indistinct M-shaped elevation bordering posterior margin, pubescence indistinct; antennal ledges with a longitudinal fovea, carinate in dorsal aspect, anterior margins oblique; clypeus flattened medially, strongly convex laterally, texture of dorsomedian area coarsely rugose; other head characters as in *Phera*.

Thorax with lateral pronotal margins parallel, disc rugose and punctate; proepimeron with lower marginal area not distinctly depressed, its length much less than width; posterior portion of scutellum with transverse striations; otherwise as in *Phera* (female unknown). Hindwing as in *Phera* but with vein R_{2+3} entire. Anterior tibiae not dilated. Hindlegs with femoral setal formula 2:1:0; first tarsomere with length less than combined length of second and third.

Male genitalia: Pygofer not strongly produced, its posterior margin rounded, disc with numerous evenly dispersed microsetae, with a posteroventral process which extends anteroventrally. Plates separate throughout their length, not extending as far posteriorly as pygofer apex, each triangular, with numerous evenly dispersed microsetae and small macrosetae. Style extending farther posteriorly than apex of connective, with distinct preapical lobe, apex rounded. Connective Y-shaped with arms widely divergent, stem keeled. Aedeagus with preatrium long, shaft short and with paired basal processes. Paraphyses absent.

Female unknown.

Quichira is known only from the type-species, which is from Panama. It is related to *Oncometopia*, from which it can be distinguished by the, non-inflated appearance of the aedeagus, the retrorse pygofer process, and externally by the form of the clypeus, which is broadly flattened.

Quichira tegminis, *new species*

FIGURE 221

External characters as in generic description. Male genitalia with pygofer process slender and acute at apex; aedeagal processes curved

posterodorsally and acute apically; shaft short, truncate apically. Color of dorsum entirely castaneous except head which is black, face and legs castaneous.

Holotype male, Volcán de Chiriquí, 8,000 ft. (Champion) (BM).

50. *Genus* TAPAJOSA Melichar

FIGURES 222–227

Tapajosa Melichar, 1924a:241. Type-species: [*Tettigonia*] *fulvopunctata* Signoret, by original designation.

Length 8.1–11.1 mm.

Head not strongly produced, its median length at least two-thirds interocular width and one-half or less its transocular width, ocelli located slightly behind a line between anterior eye angles, each slightly closer to adjacent eye angle than to median line, disc with a shallow transverse fovea before ocelli, with or without pubescence (very fine and sparse when present), without an M-shaped elevation bordering posterior margin; face with clypeus convex, not flattened medially, muscle impressions usually not very distinct; other head characters as in *Phera*.

Thorax in lateral aspect with a complete dorsopleural carina which is oblique and either rectilinear or very slightly sinuate; proepimeron with lower portion depressed but with length less than in *Phera;* posterior portion of scutellum transversely striate, other characters as in *Phera*. Forewing coriaceous, with an apical membrane which is not strongly delimited anteriorly and which includes all apical cells, texture with or without sculpturing, claval veins separate throughout their length, otherwise as in *Phera*. Hindwing as in *Phera* (exception: *T. doeringi* (Berg)). Anterior tibiae not dilated apically. Hindlegs with femoral setal formula 2:0:0; first tarsomere with length greater or less than combined length of second and third tarsomeres.

Male genitalia: Pygofer strongly produced and rounded apically, with many dispersed microsetae and occasionally with a few interspersed macrosetae, without processes. Plates fused basally, not extending as far posteriorly as apex of pygofer, each triangular and with numerous dispersed microsetae. Style with length variable interspecifically with relation to apex of connective, with or without an anteapical lobe, apex variable interspecifically. Connective Y- or V-shaped, with or without a median keel. Aedeagus nearly always symmetrical, with shaft long or short, with pair of processes arising at base and branched in some species. Paraphyses absent.

Female abdominal sternum VII with posterior margin nearly transversely rectilinear and either with a small median concavity, or with a deep concavity.

Species of *Tapajosa* have been studied from Bahia, Ceara, and Minas Geraes in Brazil, from Venezuela, Curaçao, Bolivia, and Argentina. Schröder (1961a:89) studied specimens from Uruguay. The genus is related to *Oncometopia*, from which it can be distinguished by its smaller size, its depressed lower proepimeral area, its striate scutellum, its lack of pygofer processes, and its partly fused male plates.

The type-species is to date without a type specimen. There are two specimens in the Naturhistorisches Museum in Vienna, one from Oaxaca, if I have read the poorly written label correctly, the other labeled North America, which is surely an error. The type locality is Bahia, which is also the type locality of *T. marginula* (Osborn). A specimen (HNHM), determined as *T. fulvopunctata* (Signoret) by Melichar, is conspecific with the paratype of *T. marginula* illustrated here. The present interpretation of the identity of *T. fulvopunctata* is based on this Melichar determination; those of *T. rubromarginata* (Signoret) and *T. similis* (Melichar) are based on a study of Schröder's lectotypes; that of *T. doeringi* (Berg), on a study of syntypes of both sexes.

Tapajosa tucumana (Taschenberg) is placed in synonymy on the basis of a study of the female holotype from HS.

SPECIES OF TAPAJOSA

[*Type not seen.]

doeringi (Berg), 1879d:248 (*Tettigonia*). Argentina. New combination.

**fulvopunctata* (Signoret), 1854c:484 (*Tettigonia*). Venezuela, E. Brazil.

fulvopunctata var. *concolor* Melichar, 1924a:242. New synonymy.

marginula (Osborn), 1926b:170 (*Oncometopia*). New synonymy.

ocellata (Osborn), 1926b:169 (*Oncometopia*). Venezuela, Bolivia, SE. Brazil. New combination.

rubromarginata (Signoret), 1855d:793 (*Tettigonia*). N. Argentina. New combination.

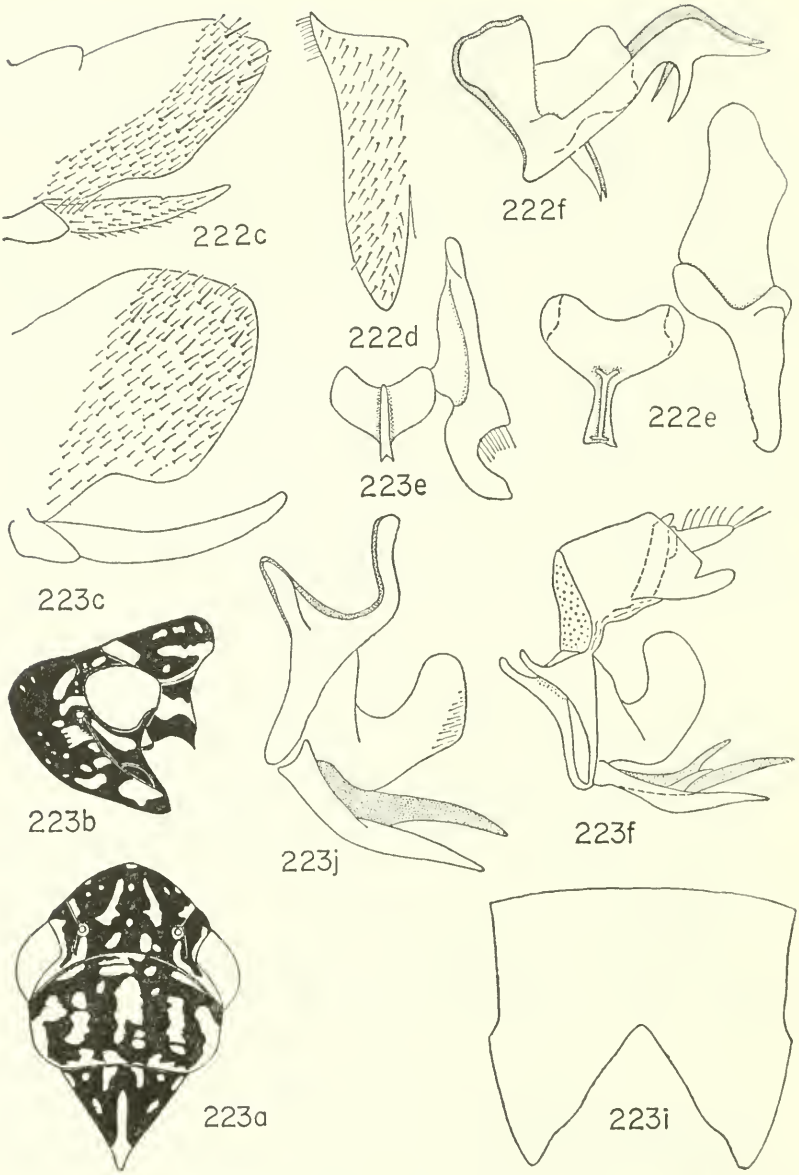
tucumana (Taschenberg), 1884a:445 (*Tettigonia*). New synonymy.

similis (Melichar), 1925a:365 (*Cuerna*). Argentina. New combination.

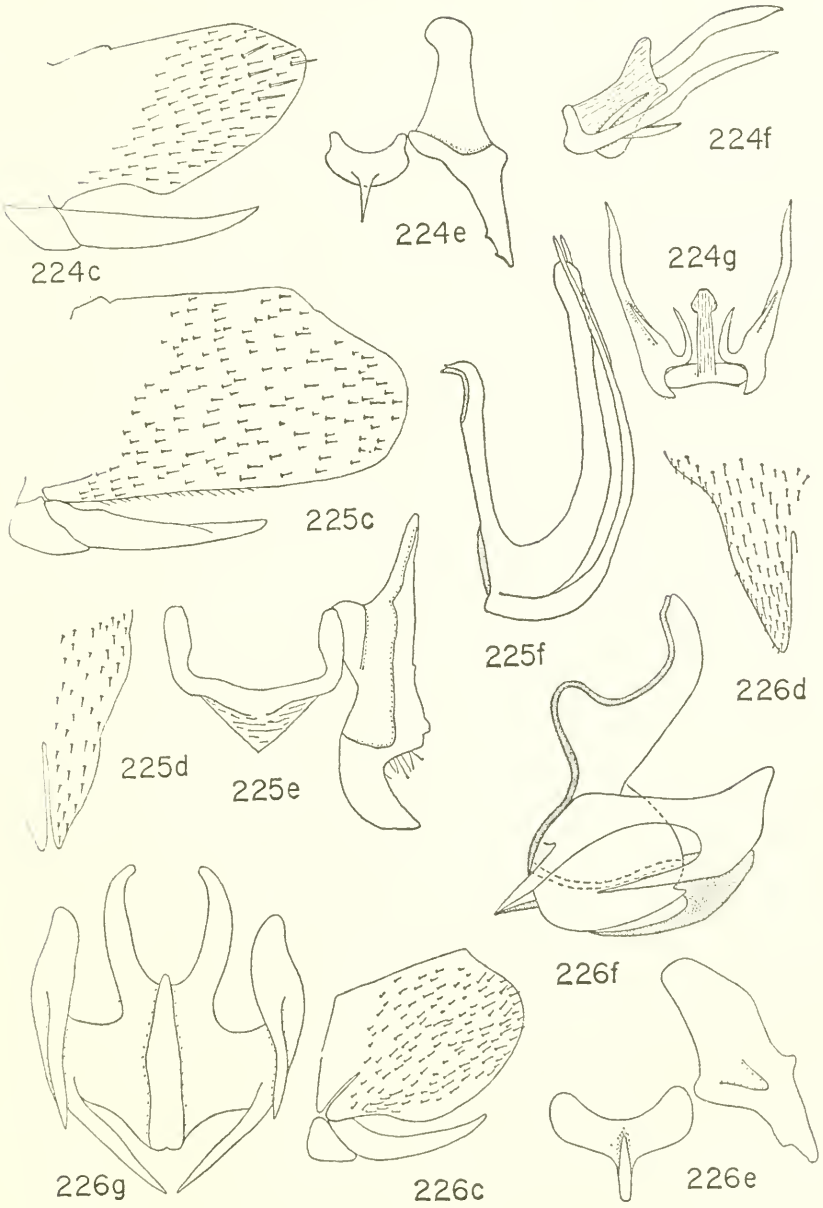
spinata, new species. Venezuela, Ecuador.

KEY TO MALES OF TAPAJOSA

1. Hindwing with vein R_{2+3} entire . . . T. doeringi (Berg) (fig. 223)
   Hindwing with vein R_{2+3} incomplete 2
2. Aedeagus with processes twice-branched at base.
   T. spinata, new species
   Aedeagus with processes not as above 3
3. Aedeagus with processes unbranched.
   T. ocellata (Osborn) (fig. 225)
   Aedeagus with processes branched 4



FIGURES 222, 223.—**222,** *Tapajosa fulvopunctata* (Signoret), from a paratype of *T. marginula* (Osborn) from Bahía, Brazil. **223,** *T. doeringi* (Berg) (**a, b, f, i** from cotypes; others from specimen from Río Negro, Argentina): **j,** aedeagus, lateral view.



FIGURES 224–226.—**224**, *Tapajosa spinata*, new species, topotype. **225**, *T. ocellata* (Osborn), specimen from Chapada, Brazil. **226**, *T. similis* (Melichar), specimen from Argentina.

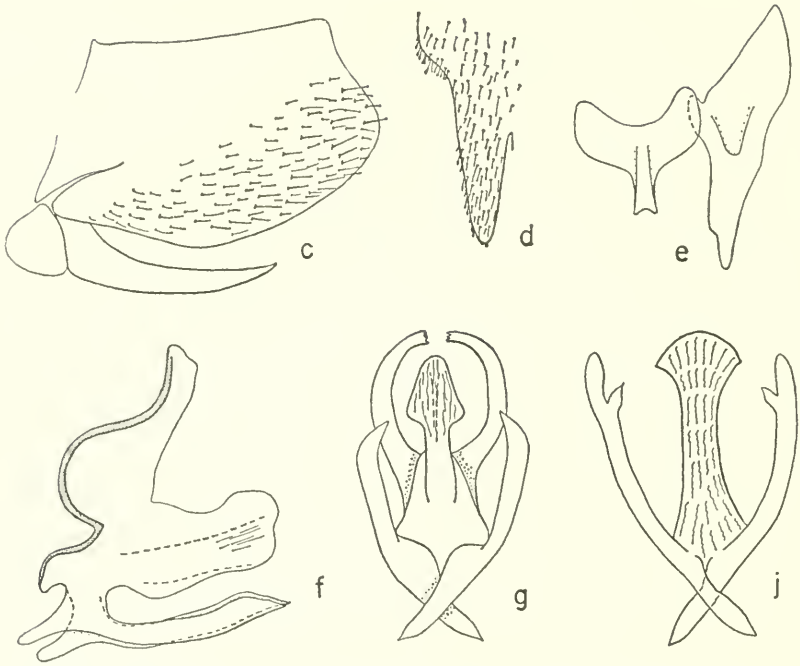


FIGURE 227, *Tapajosa rubromarginata* (Signoret), from "Argentina": j, aedeagus, caudoventral view, dorsal apodeme not shown.

4. Aedeagal processes with two subequal branches at apex, basal branches not recurved . . T. fulvopunctata (Signoret) (fig. 222)
   Aedeagal processes, if branched apically, with rami unequal and dissimilar, basal branches directed proximally. 5
5. Aedeagal processes strongly recurved apically.
   T. similis (Melichar) (fig. 226)
   Aedeagal processes not so . T. rubromarginata (Signoret) (fig. 227)

Tapajosa spinata, *new species*

FIGURE 224

Length of male 8.8–9.8 mm.; of female 10.9–11.2 mm. Head with fine sparse pubescence on disc of crown. Thorax with dorsopleural carina rectilinear. Male with aedeagal shaft short, broad, submembranous in lateral aspect, narrow in posteroventral aspect, with a pair of basal processes each of which is trifid at base, the two shorter rami barely attaining apex of shaft, the longer ramus greatly exceeding it; style without a preapical lobe, with two short angular anteapical teeth on mesal margin; connective Y-shaped, the arms divergent but not long,

stem keeled. Other structural characters as in generic description. Color of anterior dorsum and face black or brown, mottled with yellow, with a median and two lateral yellow stripes on apical two-thirds of crown; forewings dull red, with veins usually paler, especially in basal third of each wing.

Holotype male, Maracay, Venezuela, and a long series of topotypes (SSM); additional specimens from Venezuela (MMB, HNHM, and and the Bronx Zoo); and from Ecuador (IZP).

This species is closely related to *T. fulvopunctata* (Signoret), from which it may be separated by its smaller size and especially by the aedeagal processes which are branched apically in *T. fulvopunctata*, basally in *T. spinata*.

51. Genus MOLOMEA *China*

FIGURES 228–243

Oncometopia subg. *Centrometopia* Melichar, 1925a:399, preoccupied. Type-species: [*Tettigonia*] *personata* Signoret, by original designation.
Molomea China, 1927d:283, as new name for *Centrometopia* Melichar.
Centrometopides Strand, 1928a:73, as new name for *Centrometopia* Melichar.

Length 11.0–16.3 mm.

Head moderately produced, its median length varying from two-fifths to three-fourths its interocular width, and from one-third to almost one-half transocular width, anterior margin rounded in dorsal aspect, without a carina at transition from crown to face, ocelli located on a line between anterior eye angles, each equidistant from adjacent eye angle and median line of crown (rarely closer to adjacent eye angle), without an M-shaped elevation bordering posterior margin, without a longitudinal carina laterad of each ocellus, with a transverse shallow depression on crown, disc without pubescence, lateral clypeal sutures extending onto crown and attaining ocelli; antennal ledges protuberant in dorsal aspect, usually with a longitudinal depression, carinate or not dorsally in lateral aspect, anterior margins steeply declivous; clypeus strongly convex, muscle impressions distinct; transclypeal suture obscure; face finely pubescent; clypellus not protuberant, its contour continuing profile of clypeus.

Thorax with pronotal width less than transocular width of head, lateral margins parallel, disc usually rugose, with a pair of distinct broad shallow depressions near lateral margins at midlength, usually without pubescence, in lateral aspect with a complete dorsopleural carina which is arched slightly downward; proepimeron with lower marginal area not depressed, its width greater than length; posterior portion of scutellum with or without transverse striations. Forewings

with an apical membrane, veins distinct and often elevated, texture of clavus and corium strongly coriaceous and occasionally punctate, with only four apical cells, the base of the third slightly more distal than base of fourth, claval veins parallel, without an anteapical plexus of veins or anteapical supernumerary crossveins to costal margin. Hindwing at rest extending almost as far posteriorly as forewing, vein R_{2+3} incomplete except in type-species. Hindlegs at rest with knees not attaining posterior proepimeral margins; setal formula 2:0:0, 2:1:0, 2:1:1, or 2:1:1:1; first tarsomere with length equal to or less than (exception: *M. exaltata* (Melichar)) combined length of second and third tarsomeres.

Male genitalia: Pygofer in lateral aspect strongly produced and usually rounded apically, with numerous dispersed microsetae and a few interspersed macrosetae, usually without processes. Plates fused basally, very short, not extending nearly as far posteriorly as pygofer apex, their basal portions concealed by abdominal sternum VIII in unmacerated specimens, with dispersed microsetae and occasionally with a few interspersed macrosetae. Style variable in length compared with apex of connective, with very distinct preapical lobe (exception: *M. hamleti* (Distant)), rounded apically. Connective Y-shaped, T-shaped, or in form of transverse bar, usually carinate medially. Aedeagus variable interspecifically, and intraspecifically to a considerable degree in some species. Paraphyses absent.

Female abdominal sternum VII with a median projection on posterior margin.

This genus occurs in Ecuador, Peru, Brazil, and Paraguay. Specimens labeled "Mexico" have also been found in collections, but as Schröder has pointed out previously, these locality labels are probably in error. *Molomea* is closely related to *Oncometopia*, from which it may be distinguished by its pygofer which is produced more posteriorly than is common in *Oncometopia* and by its very short male plates which are fused basally, in addition to the characters listed in the key. It is also closely related to *Tapajosa* from which it may be distinguished by the characters used in the key and by its larger size and more robust appearance.

In addition to the synonymy listed in the check list below, there is some likelihood that *M. vermiculata* (Signoret) and *M. consolida* Schröder should be synonymized. Specimens determined by Berg as *M. vermiculata* are conspecific with *M. consolida*, but it is doubtful that Berg had seen a typical specimen of *M. vermiculata*. There are no specimens of *M. vermiculata* in the Signoret collection in Vienna and no specimen was sent to me from the Zoölogisches Museum der Humboldt-Universität in East Berlin with the other Signoret types from that institution. The

type should be in the Signoret collection in Berlin. The group of species *zikani-alternata-novarae-lineiceps* is difficult taxonomically because of the tendency for the aedeagal processes to be variable in length. Also, in addition to the synonymy listed below, it is likely that *M. laminata* (Signoret), of which the only specimen seen was without an abdomen, is conspecific with *M. flavolimbata* (Signoret). *M. xanthocephala* (Germar) is interpreted in the sense of a specimen in the Zoologisches Museum in Hamburg, which is apparently a syntype, and which had been studied by Schröder. *M. terminalis* (Walker) is placed in synonymy as a result of a study of the genitalia of the male lectotype.

The present interpretation of *Molomea personata* (Signoret) is based on the lectotype of this species. *M. magnifrons* (Walker) is placed in synonymy as a result of a gross examination of the female holotype. *M. hamleti* (Distant) is illustrated (fig. 231) from a male compared with the female lectotype. Schröder's (1959a:36) work is followed here in the identification of *M. exaltata* (Melichar).

The present identification of *Molomea flavolimbata* (Signoret) follows Schröder (1959a:40). *M. capito* (Distant) is listed in synonymy as a result of a comparison of the female lectotype with an illustration of the Signoret species. *M. cincta* (Signoret) is the same as Schröder's identification (1959a:39).

The male genitalia of both the lectotype of *M. impicta* Schröder and a male specimen compared with the female lectotype of *M. insignis* (Distant) are like the illustrations published here. A male of *M. alternata* (Signoret) labeled "lectotype," from the Humboldt-Universität, had genitalia like figure 243, except that the ventral ramus of each aedeagal process was longer.

SPECIES OF MOLOMEA

[*Type not seen. †Known only from female. §No specimens studied.]

alternata (Signoret), 1855d:795 (*Tettigonia*). Brazil.
biimpressa (Signoret), 1855d:811 (*Tettigonia*). Mexico (?).
bimaculata (Signoret), 1854b:362 (*Tettigonia*).
cincta (Signoret), 1854b:363 (*Tettigonia*). Brazil, S. Brazil.
**signoreti* (Melichar), 1925a:402 (*Oncometopia*) (fide Schröder).
confluens (Melichar), 1925a:393 (*Oncometopia*). SE. Brazil.
consolida Schröder, 1959a:41. S. and SE. Brazil.
consorta (Melichar), 1925a:389 (*Oncometopia*). Brazil, Peru.
**exaltata* (Melichar), 1925a:389 (*Oncometopia*). Brazil, Peru. New combination.
**flavolimbata* (Signoret), 1854b:360 (*Tettigonia*). S. Brazil.
capito (Distant), 1908b:66 (*Oncometopia*).
†*guttulata* (Melichar), 1925a:388 (*Oncometopia*) Peru.
hamleti (Distant), 1908b:63 (*Oncometopia*). SE. Brazil. New combination.

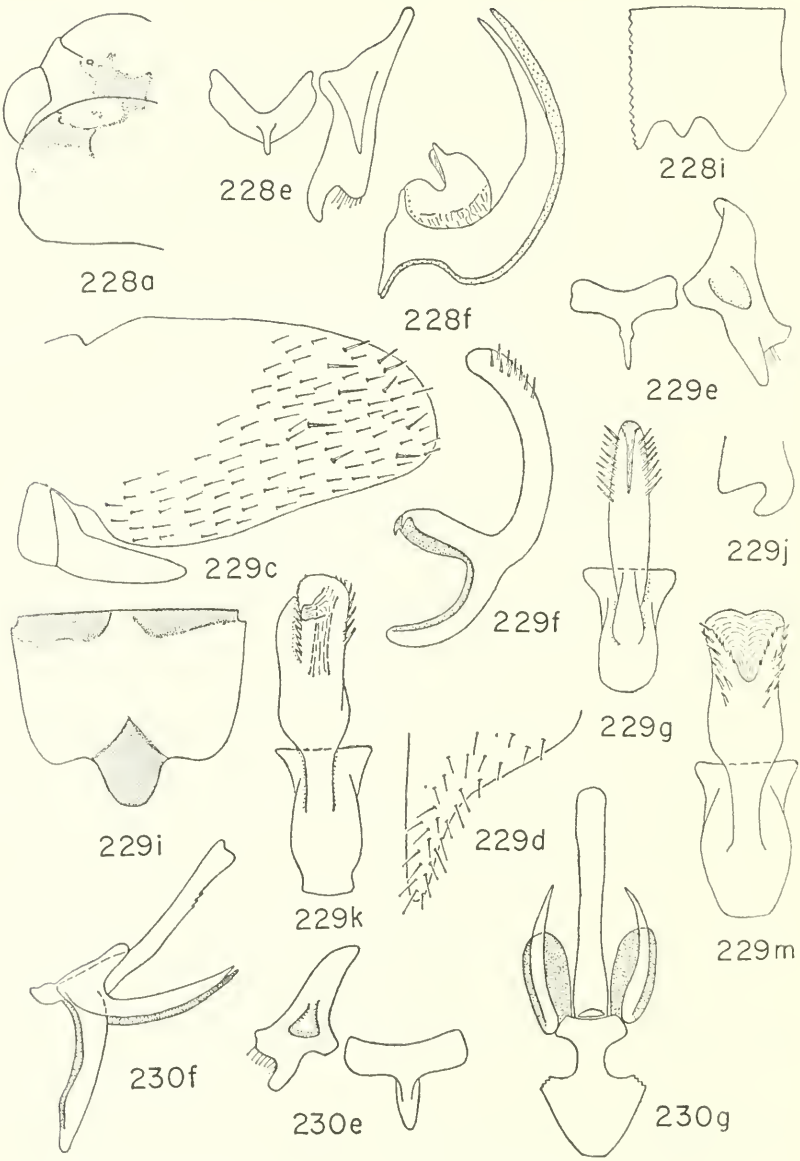
†**infulata* (Melichar), 1925a:388 (*Oncometopia*). Peru. New combination.
insignis (Distant), 1908b:63 (*Oncometopia*). SE. Brazil.
impicta Schröder, 1962a:162.
**laminata* (Signoret), 1855d:794 (*Tettigonia*). Brazil. New combination.
lineiceps, new species. SE. Brazil, Paraguay, Argentina.
magna (Walker), 1851b:787 (*Proconia*). SE. Brazil.
malkini, new species. Brazil.
§*novarae* Schröder, 1959a:42.
personata (Signoret), 1854b:364 (*Tettigonia*). SE. Brazil.
magnifrons (Walker), 1858b:239 (*Aulacizes*).
**vermiculata* (Signoret), 1855b:785 (*Tettigonia*) sensu Berg. S. Brazil, Argentina.
virescens (Distant), 1908b:65 (*Oncometopia*). Ecuador, Peru.
infulata var. *luteiceps* (Melichar), 1925a:389 (*Oncometopia*). New synonymy.
xanthocephala (Germar), 1821a:63 (*Tettigonia*). SE. Brazil.
terminalis (Walker), 1851b:786 (*Proconia*). New synonymy.
**sellowi* (Berg), 1884a:22 (*Tettigonia*).
§*cumulata* (Melichar), 1925a:390 (*Oncometopia*) (fide Schröder).
**vagata* (Melichar), 1925a:392 (*Oncometopia*) (fide Schröder).
zikani Schröder, 1960b:321. SE. Brazil.

KEY TO MALES OF MOLOMEA

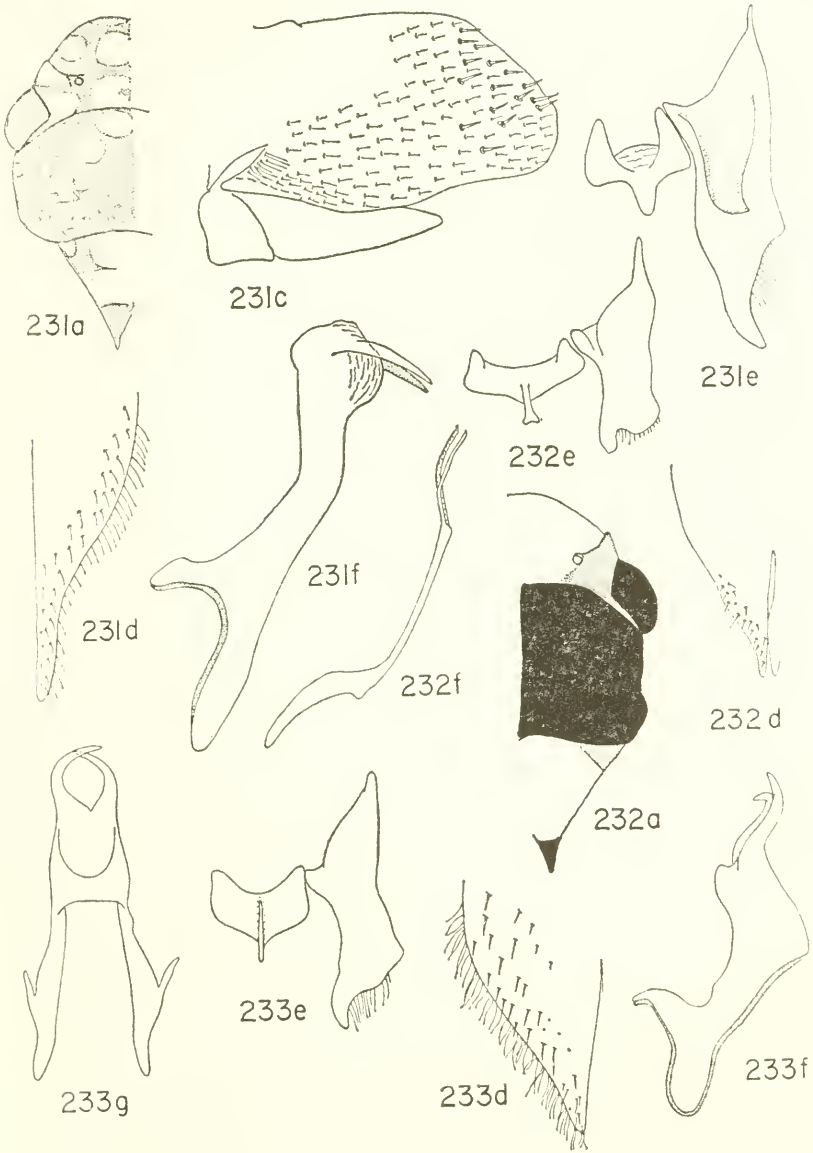
Not included: *M. guttulata* Melichar, *M. infulata* (Melichar), *M. laminata* (Signoret), and *M. vermiculata* (Signoret).

1. Hindwing with vein R_{2+3} entire.
M. personata (Signoret) (fig. 228)
Hindwing with vein R_{2+3} incomplete. 2
2. Aedeagus with a number of bilateral anteapical spinelike processes.
M. magna (Walker) (fig. 229)
Aedeagus either with apical processes only or with additional large conspicuous more basal processes. 3
3. Aedeagus with apical processes only. 4
Aedeagus without apical processes, *or* if present, then with additional processes arising more basally. 6
4. Style with distinct preapical lobe, aedeagal processes directed posteriorly or posterodorsally 5
Style without preapical lobe, aedeagal processes directed ventrally.
M. hamleti (Distant) (fig. 231)
5. Aedeagal shaft very long and slender, its length measured on ventral margin more than six times its greatest width.
M. virescens (Distant) (fig. 232)
Aedeagal shaft short and rather stout, its length measured on ventral margin not more than three times its greatest width.
M. exaltata (Melichar) (fig. 233)

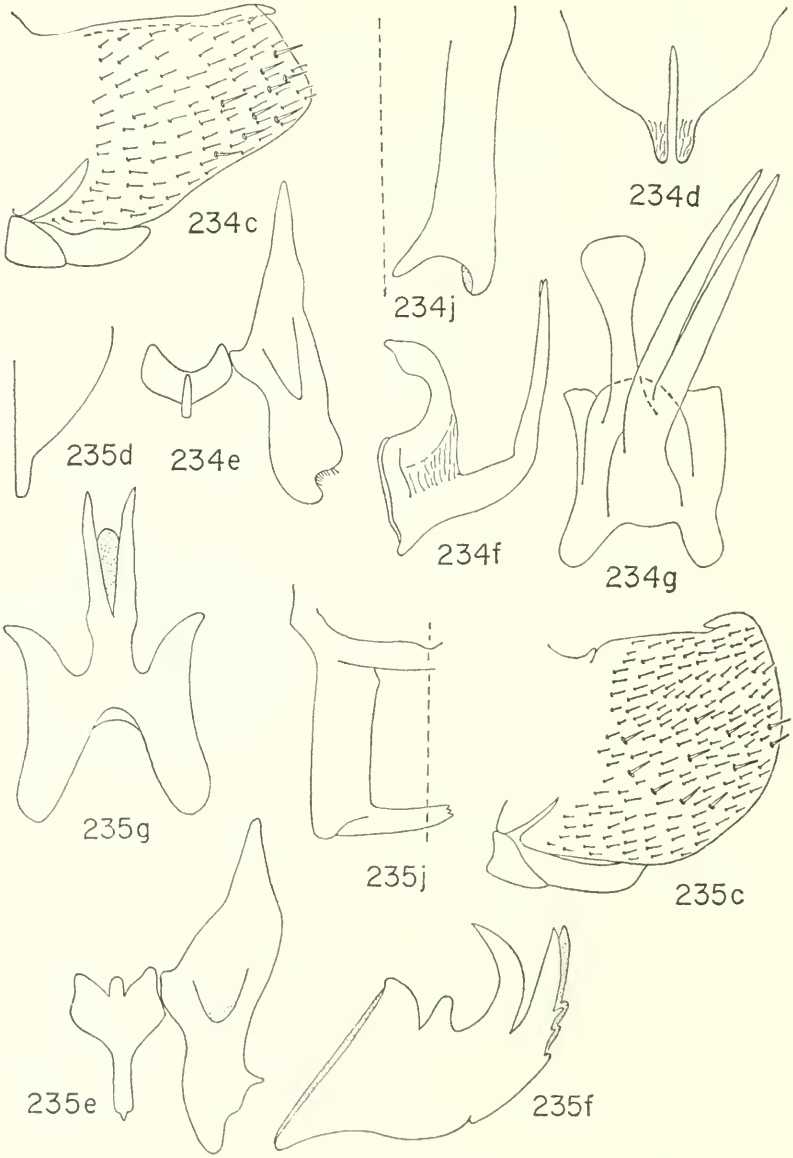
6. Pygofer with processes. 7
   Pygofer without processes. 8
7. Aedeagal processes in lateral view arising from a common stalk.
   M. flavolimbata (Signoret) (fig. 234)
   Aedeagal processes separate from their base.
   M. biimpressa (Signoret) (fig. 235)
8. Aedeagal shaft with an unpaired median process on posteroventral margin near base. . . . . **M. lineiceps,** new species (p. 250)
   Aedeagal shaft without such a process 9
9. Pronotum with a broad transverse posterior band which is not mottled. . . . . **M. cincta** (Signoret) (fig. 237)
   Pronotum not as above. 10
10. Aedeagus with processes at apex of shaft.
   M. consolida Schröder (fig. 239)
   Aedeagus without such processes. 11
11. Aedeagus in posteroventral aspect with basal processes shaped like parentheses, each with variable processes.
   M. xanthocephala (Germar) (fig. 240)
   Aedeagus not so. 12
12. Pygofer with posterior margin angular.
   M. consorta (Melichar) (fig. 238)
   Pygofer with posterior margin rounded 13
13. Aedeagal shaft very short and with anterodorsal margin deeply concave in lateral aspect. 14
   Aedeagal shaft much longer and with anterodorsal margin broadly and very shallowly concave in lateral aspect 15
14. Head with length of crown less than two-thirds interocular width, crown tan marked with black spots.
   M. insignis (Distant) (fig. 241)
   Head with median length of crown approximately three-fourths interocular width, crown black marked with ivory.
   M. confluens (Melichar) (fig. 242)
15. Aedeagal processes each appearing chelate apically.
   M. zikani Schröder
   Aedeagal processes not so. 16
16. Aedeagus in caudoventral aspect with a constriction between base and origin of aedeagal processes.
   M. malkini, new species (p. 250)
   Aedeagus without such a constriction. 17
17. Aedeagal processes branched . **M. alternata** (Signoret) (fig. 243)
   Aedeagal processes unbranched . . . . . **M. novarae** Schröder



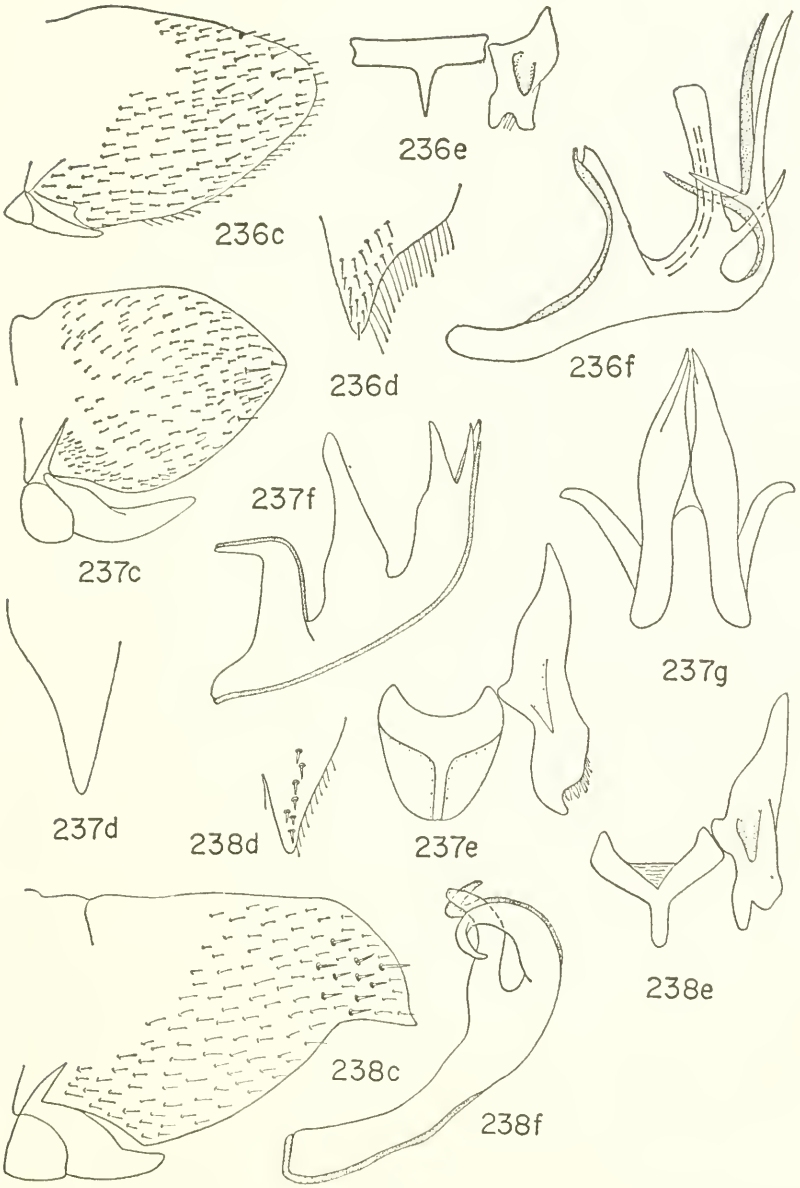
FIGURES 228–230.—228, *Molomea personata* (Signoret): **a-f** from specimen from Espírito Santo, Brazil; **i**, from 92 km. from Rio de Janeiro. **229**, *M. magna* (Walker): **c-g, j** from specimen from Paraguay; **i**, from lectotype; **k, m**, from specimens from Santa Catarina, Brazil. **230**, *M. malkini*, new species, holotype.



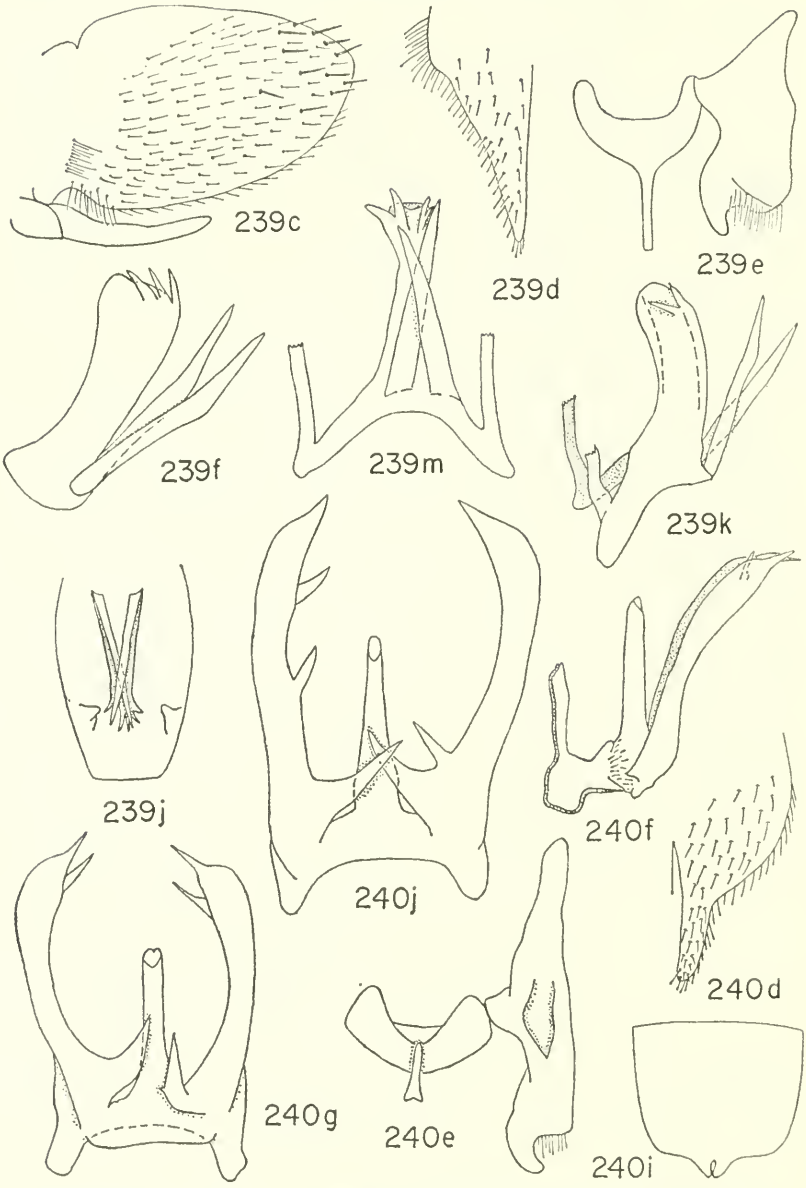
FIGURES 231–233.—**231,** *Molomea hamleti* (Distant), specimen from Brazil. **232,** *M. virescens* (Distant), from lectotype of *M. luteiceps* (Melichar). **233,** *M. exaltata* (Melichar), specimen from La Merced, Peru.



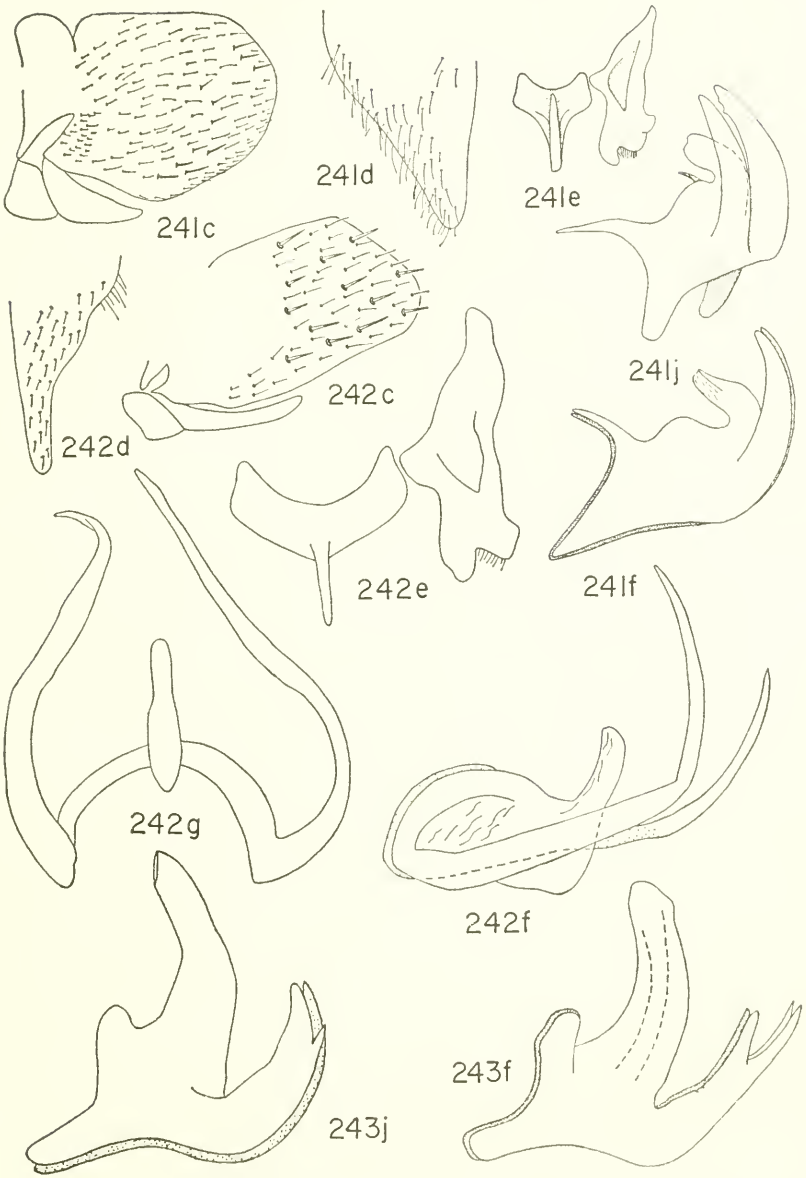
FIGURES 234, 235.—**234,** *Molomea flavolimbata* (Signoret), specimen from Paraná, Brazil (setae not shown in **d**): **j**, pygofer right side in dorsal view. **235,** *M. biimpressa* (Signoret), lectotype: **j**, pygofer, left side in dorsal view.



FIGURES 236–238.—236, *Molomea lineiceps*, new species, specimen from Santa Catarina, Brazil. 237, *M. cincta* (Signoret), specimen from Brazil, setae not shown in d. 238, *M. consorta* (Melichar), specimen from Vilcanota, Peru.



FIGURES 239, 240.—**239,** *Molomea consolida* Schröder (**c-j** from specimen from Misiones, Argentina; **k, m,** from Santa Catarina, Brazil): **j,** anal tube and aedeagal shaft in ventral view; **k,** aedeagus in lateral view; **m,** same in ventral view. **240,** *M. xanthocephala* (Germar): **d** from "cotype" from Brazil; **e-g** from specimen from Santa Catarina, Brazil; **i,** from Pôrto Alegre, Brazil; **j,** from Paraná, Brazil.



FIGURES 241–243.—**241,** *Molomea insignis* (Distant), specimen from Rio Grande do Sul, Brazil: **j,** aedeagus in caudolateral view. **242,** *M. confluens* (Melichar), from "holotype." **243,** *M. alternata* (Signoret), specimens from Chapada, Brazil: **j,** aedeagus, lateral view.

Molomea lineiceps, *new species*

FIGURE 236

Molomea terminalis (Walker), Schröder, 1959a:42, pl. 6, figs. 74, 76. Misdetermination.

Length of male 12.0–13.0 mm.; of female 11.1–13.0 mm. Head with median length of crown equal to or slightly less than interocular width and from two-fifths to one-half transocular width, ocelli each equidistant from adjacent anterior eye angle and median line, antennal ledges with a very shallow longitudinal depression, not carinate dorsally in lateral aspect. Pronotum slightly rugose on middle of disc which bears very short, sparse, pubescence, posterior portion of scutellum without transverse striations. Forewing with apical membrane including apical cells and apex of costal cell, clavus and corium not punctate. Hindlegs with femoral setal formula 2:1:0. Male pygofer without processes; style very short, not extending posteriorly beyond apex of connective, preapical lobe so large that style apex appears concave; aedeagus with shaft elongate and with a pair of slender processes, each branched in its basal half, arising from aedeagal base, and an unpaired, slender, tapering, median ventral process arising on basal half of shaft. Other structural characters as in generic description. Ground color of crown and anterior third of pronotum dull yellow with black markings, the latter outlining four areolets on disc of crown. Remainder of pronotum and forewings black mottled with sordid yellow. Scutellum yellow variously marked with black. Face flesh-colored, with a transverse black stripe bordering clypeal suture and occasionally with apex of clypellus black. Legs flesh-colored. Pleura yellow.

Holotype male, Nova Teutonia, Santa Catarina, Brazil, Oct. 16, 1952 (F. Plaumann), on indefinite loan to USNM from NCS. Additional specimens studied from Paraguay; Rio Grande do Sul and Espírito Santo, Brazil; Entre Ríos and Córdoba, Argentina.

This species is closely related to *M. xanthocephala* (Germar) but differs conspicuously in its shorter style and in its unpaired median aedeagal process which is lacking in *xanthocephala*.

Molomea malkini, *new species*

FIGURE 230

Length of male 12.3–12.5 mm.; of female 11.8–12.9 mm. Head with median length of crown slightly more than half interocular width and approximately three-fifths transocular width, ocelli each slightly closer to adjacent anterior eye angle than to median line, antennal ledges longitudinally sulcate, each carinate dorsally in lateral aspect.

Pronotum coarsely rugose on posterior half of disc, which is without pubescence, posterior portion of scutellum with transverse striations. Forewing with apical membrane as in *M. lineiceps*, new species, clavus obscurely punctate. Hindlegs with femoral setal formula 2:1:1 or 2:1:0. Male pygofer and plates as in *M. consolida* Schröder (figs. 239c and d); style very short, not extending posteriorly beyond apex of connective; connective broadly T-shaped, with stem carinate; aedeagus with shaft slender and elongate, apparently consisting of two sclerites, with a pair of articulated slender tapering processes arising at base of more apical portion. Other structural characters as in generic description.

Holotype male, Mato Grosso, Barra de Tapirapé, Jan. 1, 1963; and a series of one additional male and four female topotypes, December 1962 and January 1963 (CAS); and one male topotype, December (NCS); all collected by B. Malkin. The species is also known from Espírito Santo, Brazil (IZP).

M. malkini, new species, is closely related to *M. vermiculata* (Signoret), but differs markedly in the form of the aedeagus, which is unusual in the genus in that the processes appear to articulate with the shaft instead of being more solidly attached.

52. *Genus* CUERNA Melichar

FIGURE 244

Cuerna Melichar, 1925a:363. Type-species: [*Cercopis*] *lateralis* Fabricius, preoccupied, which is a synonym of [*Cercopis*] *costalis* Fabricius, 1803, by original designation.

Length 6.5–10.4 mm.

Head not strongly produced, with median length of crown varying from six-tenths of to one-third greater than interocular width and from four-tenths to slightly more than half transocular width, anterior margin usually broadly rounded, occasionally obtusely subangulate, without a carina separating crown from face, ocelli located on a line between anterior eye angles, each slightly closer to adjacent eye angle than to median line, without an M-shaped elevation bordering posterior margin, without a median fovea, occasionally with a weak transverse concavity between ocelli; antennal ledges not or only slightly protuberant in dorsal aspect, each with a longitudinal concavity, carinate dorsally in lateral aspect, anterior margin not declivous; clypeus convex medially, texture granulose dorsally, muscle impressions usually distinct, other head characters as in *Phera*.

Thorax in lateral aspect with an almost complete oblique dorsopleural carina which is curved and almost horizontal at its anterior end, proepimeron with length less than width; posterior portion of

scutellum usually weakly transversely striate; otherwise as in *Phera*. Forewing coriaceous, with an apical membrane, usually not punctate, claval veins not fused, otherwise as in *Phera*. Hindwing with vein R_{2+3} almost always incomplete, otherwise as in *Phera*. Anterior tibiae not dilated apically. Hindlegs with femoral setal formula 2:0:0; first tarsomere with length equal to combined length of second and third tarsomeres.

Male genitalia: Pygofer not strongly produced, broadly rounded posteriorly, with numerous evenly dispersed microsetae over most of disc, with a vestigial process on ventral margin. Plates not fused basally, not extending as far posteriorly as pygofer apex, each triangular, with numerous evenly dispersed microsetae. Style short, not extending much farther posteriorly than apex of connective, with a preapical lobe. Connective quite broad, not Y- or V-shaped, with a short median keel. Aedeagus symmetrical, shaft nearly always curved dorsally and anteriorly in apical half, with two pairs of ventral basal processes which are variable interspecifically. Paraphyses absent.

Female abdominal sternum VII with posterior margin broadly, regularly, and shallowly concave.

Species of *Cuerna* have been studied from the area from Alaska to Honduras and from the eastern to the western coast of the United States. *Cuerna* is very closely related to *Oncometopia* and *Tapajosa*, from both of which it may be separated easily by the keeled ventral edge of the proepimeron, which does not occur in either of the other genera, and by the concealed posterior meron when the wings are at rest. It is also noteworthy that in *Cuerna* the aedeagal shaft is almost always curved cephalad, a character very rare in *Oncometopia*.

The genus *Cuerna* was revised by Dr. M. W. Nielson (1965a) during the progress of the present work. Nielson studied the concealed characters at the base of the ovipositor and found them of at least equal value to the characters of the male genitalia for species differentiation. He recognized 22 valid species. *Cuerna costalis* (Fabricius) is a known vector of Phony Peach Disease and it and two other species are among a number of leafhoppers which are capable of transmitting Pierce's disease of grapes. Nielson's account of the known host plants of some of the species included alfalfa, beets, corn, cranberry, grass, lespedeza, peach, strawberry, wheat, and willow.

Turner and Pollard (1959a) published much information concerning the life history and behavior of *C. costalis* (Fabricius), including a color description of nymphs and adults, some measurements of the nymphal instars, overwintering habits, food plants, mating and oviposition, flight characteristics and parasites. This species oviposited in the field on peach, cowpea, and four species of grasses.

In view of the recency of Nielson's work and its availability, no key and no checklist of species are included, and only enough illustrations are shown to enable the reader to verify his generic identification.

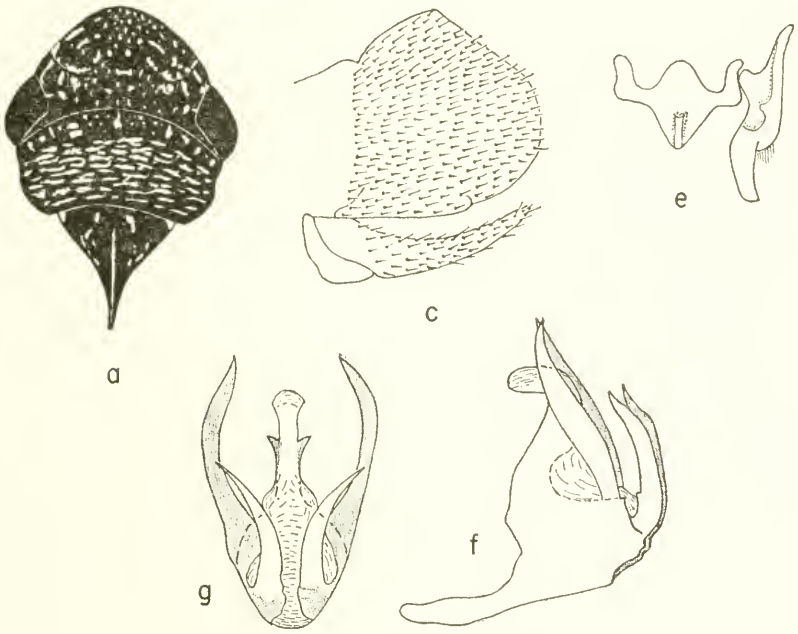


FIGURE 244.—*Cuerna* spp.: c from specimen from Yepocapa, Guatemala; others from Colorado.

53. ANACUERNA, *new genus*

FIGURE 245

Type-species: *Cuerna centrolinea* Melichar (1925a:365).

Length 7.4–8.6 mm.

Head moderately produced, its median length approximately seven-tenths its interocular width and less than half its transocular width, anterior margin broadly rounded in dorsal aspect, without a carina at transition from crown to face, ocelli located slightly behind a line between anterior eye angles, each closer to adjacent eye angle than to median line, without a median fovea, with or without a transverse concavity between ocelli, without an M-shaped elevation bordering posterior margin, disc not pubescent, lateral clypeal sutures extending onto crown and attaining ocelli; antennal ledges slightly protuberant in dorsal aspect, in lateral aspect each with a longitudinal concavity

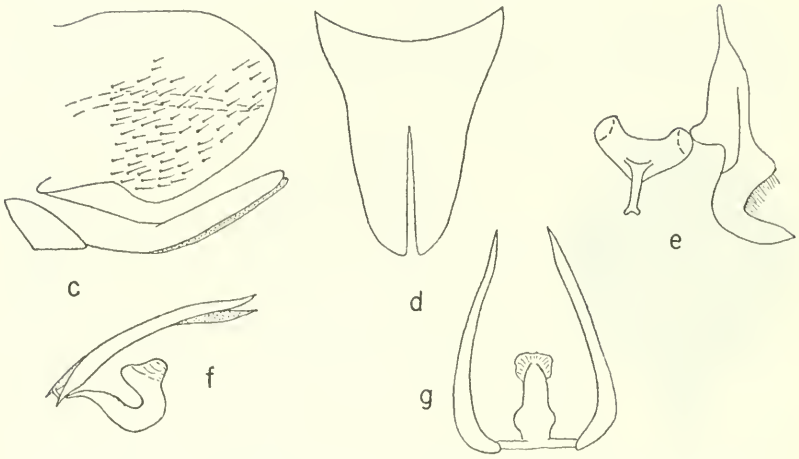


FIGURE 245.—*Anacuerna centrolinea* (Melichar), specimen from Bolivia; process in c is an aedeagal, not a pygofer process.

and carinate dorsally, anterior margins not declivous; clypeus convex, muscle impressions distinct, dorsomedian area granulate; transclypeal suture incomplete; face pubescent below; clypellus not produced, its contour continuing profile of clypeus.

Thorax with pronotal width less than transocular width of head, lateral margins parallel, disc transversely rugose and punctate, posterior margin concave, in lateral aspect with a complete dorsopleural oblique carina; scutellum transversely striate on posterior portion. Forewing with membrane not clearly delimited, veins elevated and distinct, texture weakly coriaceous except subhyaline area on each side of claval suture, with punctures bordering veins on clavus and corium, with four very short apical cells, the base of fourth more proximal than base of third, claval veins parallel, without an anteapical plexus of veins and without supernumerary anteapical veins to costa, wings of female at rest concealing ovipositor. Hindwing extending almost as far posteriorly as forewing; vein R_{2+3} entire. Hindlegs at rest with knees not attaining posterior procpimeral margins; femoral setal formula 2:0:0; first tarsomere with length equal to combined length of second and third tarsomeres.

Male genitalia: Pygofer moderately produced, apical margin rounded, disc with numerous microsetae on posterior two-thirds, without processes. Plates fused through nearly half their length, extending posteriorly about as far as posterior pygofer margin, each triangular and glabrous. Style extending posteriorly farther than apex of con-

nective, without preapical lobe, apex acute. Connective Y-shaped, arms not widely divergent, stem keeled. Aedeagus very short, U-shaped in lateral aspect, with pair of long slender tapering basidorsal processes extending posteriorly much beyond apex of shaft, closely associated basally with base of anal tube. Paraphyses absent (note aedeagal processes).

Female abdominal sternum VII with posterior margin deeply and regularly concave.

Anacuerna is known only from the type-species, which occurs in Peru and Bolivia. The present interpretation of *A. centrolinea* (Melichar) is based on an examination of a paralectotype in the Moravské Museum, Brno. The genus appears to be closely related to *Cuerna* from which it differs markedly in the form of the aedeagus, which is without ventral processes, and in the partly fused male plates, which are completely separate in *Cuerna*. Externally, the proepisternum of *Anacuerna* is not keeled on its ventral margin, as it is in *Cuerna*.

The processes associated with the aedeagal base might equally as well be designated anal processes or paraphyses in *Anacuerna*. They are treated here as aedeagal processes because of the apparent relationship of this genus to *Cuerna*, where there are four aedeagal processes and no paraphyses or anal processes.

54. DECHACONA, *new genus*

FIGURE 246

Type-species: *Tettigonia missionum* Berg (1879d:248).

Length 6.5–8.5 mm.

Head not strongly produced, its median length less than half interocular width and from one-fourth to one-third transocular width, anterior margin broadly rounded, not carinate at transition from crown to face, ocelli located slightly behind a line between anterior eye angles, each slightly closer to adjacent eye angle than to median line, with a transverse elevation bordering posterior margin, with transverse fovea between ocelli, without a longitudinal carina laterad of each ocellus, disc with sparse pubescence, lateral clypeal sutures extending onto crown and attaining ocelli; antennal ledges not protuberant in dorsal aspect, in lateral aspect each with a very slight anterior concavity, not carinate dorsally, anterior margin oblique; clypeus convex, muscle impressions distinct; transclypeal suture incomplete; face finely pubescent below; clypellus not protuberant, its contour continuing profile of clypeus.

Thorax with pronotal width less than transocular width of head, lateral margins parallel, with a deep transverse sulcus behind anterior

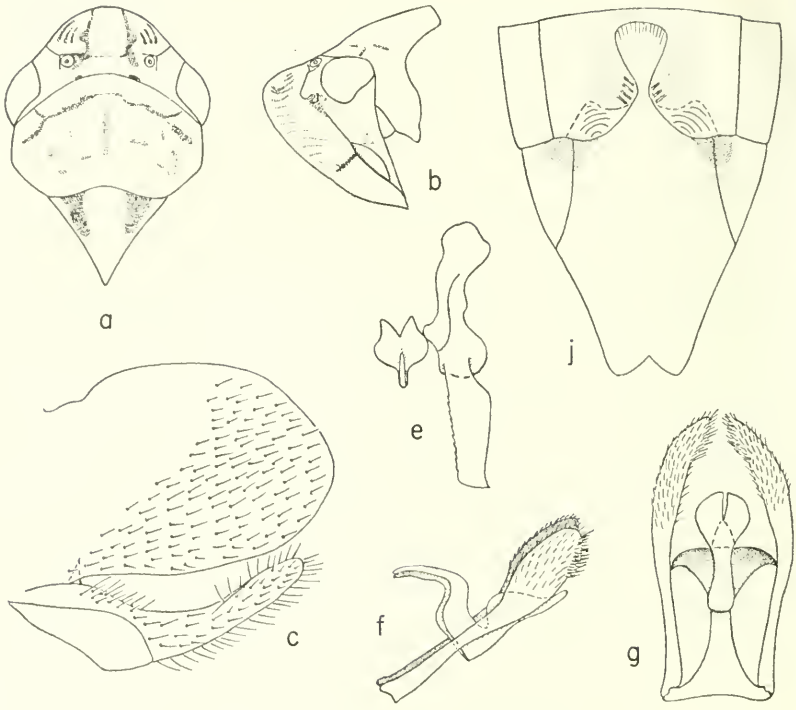


FIGURE 246.—*Dechacona missionum* (Berg) (**a, b, j** from specimen labeled "type;" **c-g** from allotype of *D. minor* (Osborn) from Paraguay): **j**, ventral view of apex of abdomen of female.

margin, disc punctate and coarsely pubescent, posterior margin concave, in lateral aspect with a complete dorsopleural carina which is nearly rectilinear; scutellum pubescent, its posterior portion weakly striate. Forewing with membrane including apical cells only, veins obscure, texture strongly coriaceous, punctate and pubescent in clavus and corium, with four apical cells, base of fourth slightly more proximal than base of third, claval veins parallel, without an anteapical plexus of veins and without anteapical supernumerary crossveins to costa, wings of female in rest position exceeding ovipositor. Hindwing at rest extending almost as far posteriorly as forewing; vein R_{2+3} incomplete. Hindlegs at rest with knees not attaining posterior proepimeral margins; femoral setal formula 2:0:0; first tarsomere with length approximately equal to combined length of second and third tarsomeres.

Male genitalia: Pygofer moderately produced, posterior margins broadly rounded, disc with numerous evenly dispersed microsetae on apical two-thirds, without processes. Plates separate throughout their

length, not extending as far posteriorly as pygofer apex, each triangular and with numerous evenly distributed microsetae. Style extending much farther posteriorly than apex of connective, without preapical lobe, apex truncate. Connective very small, narrowly Y-shaped, arms subparallel, stem carinate. Aedeagus short, with pair of processes arising at base, each process finely hairy in apical half. Paraphyses absent.

Female abdominal sternum VII with posterior margin deeply emarginate medially.

Dechacona is known only from the type-species, which occurs in Peru, Paraguay, northern Argentina, and southern Brazil. A specimen labeled "Type" has been studied. *Dechacona* is similar to *Tapajosa* Melichar in a number of characters, but differs markedly externally by the pubescence of the scutellum and forewings, in that the forewings at rest do not expose the posterior meron, and in the male genitalia in that the male plates are not fused basally.

Oncometopia minor Osborn (1926b:170) of which I have studied the type, is a junior synonym of *D. missionum* (Berg), new synonymy.

55. Genus ACROGONIA Stål

FIGURES 247–261

Acrogonia Stål, 1869a:67. Type-species: *Cicada lateralis* Fabricius, 1803 (preoccupied =*Acrogonia ignota*, new name, here proposed) by subsequent designation of Evans (1947a:158).

Pherodes Fowler, 1899b:225. Type-species: *Pherodes flammeicolor* Fowler, by monotypy. New synonymy.

Orectogonia Melichar, 1926a:345. Type-species: [*Tettigonia*] *sparsuta* Signoret, by subsequent designation of China (1938d:184). New synonymy.

Astenogonia Melichar, 1926a:345. Type-species: [*Cicada*] *bicolor* Fabricius, 1803, preoccupied, =*Capinota virescens* Metcalf, by subsequent designation of China (1938d:184). New synonymy.

Sansalvadoria Schröder, 1959a:48. Type-species: *S. bimaculata* Schröder, which is a junior synonym of *Tettigonia flavoscutellata* (Signoret), by monotypy.

Length 9–14 mm.

Head strongly produced, median length of crown exceeding interocular width, in some species exceeding transocular width, anterior margin carinate and slightly elevated, ocelli located behind a line between anterior angles of eyes, each approximately equidistant between adjacent eye angle and median line of head, usually without an M-shaped elevation bordering posterior margin, without a longitudinal carina laterad of each ocellus, disc concave in almost all species, midline impressed, surface without pubescence; antennal ledges longitudinally sulcate, in lateral aspect carinate dorsally in most species,

anterior margins steeply declivous; clypeus varying interspecifically, most often convex, flattened or depressed in a few species, muscle impressions distinct; face pubescent or not; clypellus not produced, its contour continuing profile of clypeus.

Thorax with width of pronotum less than transocular width of head, lateral margins parallel, disc usually smooth, rarely minutely rugose or punctate, posterior margin concave, with a complete dorsopleural carina which is diagonally rectilinear or arched slightly downward at midlength; scutellum without striae. Forewing varying from completely hyaline, or hyaline with a few coriaceous areas, to coriaceous with a membrane, veins distinct, occasionally elevated, surface rarely punctate, with four apical cells, the base of the fourth more proximal than base of third, without supernumerary veins in corium, rarely with few supernumerary crossveins in clavus, wings at rest concealing ovipositor in female, in some species leaving apex of pygofer exposed in male. Hindwing extending almost as far posteriorly as apex of forewing, vein R_{2+3} interrupted. Hindlegs with setal formula usually 2:0:0, rarely 2:1:1 or 3:0:0; first tarsomere with length greater than combined length of second and third tarsomeres.

Male genitalia: Pygofer very strongly produced posteriorly, with numerous dispersed microsetae except in basal portion, without processes. Plates united at base in some species, not extending nearly as far posteriorly as pygofer apex, triangular, with numerous dispersed microsetae. Style usually extending posteriorly farther than apex of connective, usually without preapical lobe, variously modified at apex. Connective variable interspecifically, from Y-shaped to linear, without a median keel. Aedeagus symmetrical, slender and elongate, without basal processes, shaft often with apical processes or bifid apically. Paraphyses absent. Anal tube often with an unpaired ventral process, occasionally with base of tube modified and with sclerotized processes, or with a pair of laterotergites.

Female abdominal sternum VII produced laterally, posterior margin from slightly to deeply emarginate.

The relationship of *Acrogonia* to other genera is unknown. Species occur from Central America to southeastern Brazil and to Bolivia. The males are easily recognized in collections by the elongate pygofer which often is not completely concealed by the wings in rest position. There is a great deal of intraspecific color variation. The flattened form of the posterior tibiae and the slender, close-set setae of row 1 of the posterior tibiae suggest a relationship to the Cicadellini.

The identity of *Acrogonia sparsuta* (Signoret) is unknown. None of the specimens in NMV are eligible as lectotypes, and no specimens were sent with the Signoret types from HU. Specimens determined by Meli-

char in Brno and Budapest are from Peru. The type locality is Venezuela.

Acrogonia rostrata (Signoret) is also an unknown species. No specimens from Bahia, Brazil, the type locality were found in NMV nor sent from HU.

The only specimen of *A. pustulata* (Fabricius), in the Fabrician collection at Copenhagen, is the lectotype, which is without abdomen.

A. plana (Fabricius) is known only from a single, badly damaged, teneral specimen in Copenhagen.

The genitalia of the male lectotype of *Acrogonia obscurior* (Fowler) agree well with the specimens illustrated in figure 250, and those of the male lectotype of *A. bicolor* (Fabricius) with the illustrations (fig. 254) of *A. virescens* (Metcalf), except for the aedeagus, illustrated in figure 254n.

The type of *Acrogonia delicata* (Osborn) and the lectotype of *A. flavoscutellata* (Signoret) are females. Male specimens have not been compared directly with the lectotype of the Signoret species. The abdominal sternum VII of the female lectotype of *A. nigriceps* (Signoret) is much similar to the accompanying illustration of *A. izzardi*, new species (fig. 248i), but is cleft more deeply.

The present interpretation of *Acrogonia gracilis* (Osborn) is based on male specimens compared with the female type. The abdominal sternum VII of the female lectotypes of *A. flaveola* (Fabricius) and of *A. libidinosa* (Signoret) are bilobate with a deep cleft between the lobes.

In the check list below, *Acrogonia olivacea* (Osborn) is placed in synonymy under *A. sagittaria* (Walker) on the basis of a comparison with figure 261 of the very teneral male holotype of the Walker species, which was not dissected. The lectotype male of *A. salax* (Signoret) is teneral, with the genital capsule distorted; it was not dissected.

SPECIES OF ACROGONIA

[*Type not seen. †Known only from female.]

balloui, new species. Venezuela, Trinidad Is.

flagellata, new species. Fr. Guiana.

flammeicolor (Fowler), 1899b:226 (*Pherodes*). S. Mexico, Costa Rica.

†*flaveola* (Fabricius), 1803a:65 (*Cicada*). S. America. New combination.

flaveoloides, new species. SE. Brazil.

flavoscutellata (Signoret), 1855c:509 (*Tettigonia*). El Salvador, Panama, Venezuela, Br. and Fr. Guiana, N. and E. Brazil. New combination.

delicata (Osborn), 1926b:167 (*Aulacizes*). New synonymy.

bimaculata (Schröder), 1959a:148 (*Sansalvadoria*). New synonymy.

gracilis (Osborn), 1926b:167 (*Aulacizes*). Panama, Colombia, E. Brazil. New combination.

hastata (Walker), 1858b:245 (*Ciccus*). "Santarem," Brazil. New combination.

†*ignota*, new name (in generic synonymy, p. 257). S. America.

lateralis (Fabricius), 1803a:64 (*Cicada*), preoccupied.

fabricii Metcalf, 1965a:415, not Metcalf, 1955a·265. New synonymy.

izzardi, new species. Br. Guiana.

†*libidinosa* (Signoret), 1862d:587 (*Tettigonia*). Peru. New combination.

nigriceps (Signoret), 1855c:508 (*Tettigonia*). Guatemala, Costa Rica, Panama, Venezuela. New combination.

obscurior (Fowler), 1899a:224 (*Phera*). Guatemala, Colombia, Peru. New combination.

plana (Fabricius), 1787a:261 (*Fulgora*).

pustulata (Fabricius), 1803a:6 (*Cicada*), new name.

punctata (Fabricius), 1803a:64 (*Cicada*), not 1775.

**rostrata* (Signoret), 1855c:509 (*Tettigonia*). New combination.

sagittaria (Walker), 1858b:245 (*Ciccus*). Brazil.

olivacea (Osborn), 1926b:167 (*Aulacizes*). New synonymy.

salax (Signoret), 1862d:588 (*Tettigonia*). Peru. New combination.

**sparsuta* (Signoret), 1855c:508 (*Tettigonia*). New combination.

stylata, new species. Peru.

terminalis, new species. Peru, Bolivia.

tridentata, new species. Peru, Bolivia, Brazil.

virescens (Metcalf), 1949b:268 (*Capinota*). Br. Guiana, Peru, Central Brazil, Paraguay. New combination.

bicolor (Fabricius), 1803a:65 (*Cicada*), preoccupied.

fabricii (Metcalf), 1955a:265 (*Astenogonia*), as new name for *Cicada bicolor* Fabricius, not Olivier. New synonymy.

KEY TO MALES OF ACROGONIA

Not included: *A flaveola* (Fabricius), *A. ignota*, new name (fig. 247), *A. libidinosa* (Signoret), *A. plana* (Fabricius), *A. pustulata* (Fabricius), *A. rostrata* (Signoret), *A. sagittaria* (Walker) (fig. 261), *A. salax* (Signoret), and *A. sparsuta* (Signoret).

1. Connective with arms widely divergent, each arm nearly as long as stem *and* aedeagus with paired conspicuous processes. . 2
   Connective linear, or more narrowly Y-shaped with arms much shorter than stem *or* aedeagus without paired conspicuous processes 6
2. Aedeagal processes arising at midlength of shaft.
   A. izzardi, new species (p. 265)
   Aedeagal processes arising at apex of shaft 3
3. Aedeagus with three elongate slender processes.
   A. tridentata, new species (p. 269)
   Aedeagus with only two such processes. 4
4. Median ventral anal process occurring at midlength of abdominal X; styles slender, each more than twice length of connective.
   A. stylata, new species (p. 270)
   Median ventral anal process occurring before midlength of abdominal X; styles each less than twice length of connective. . . . 5

5. Basal sclerite of anal tube with apex as in figure 250.
A. obscurior (Fowler)
Basal sclerite shaped as in figure 251 . . **A. flammeicolor** (Fowler)
6. Styles truncate apically, not extending as far posteriorly as apex of connective . . . . . **A. balloui**, new species (p. 266)
Styles not truncate apically, extending posteriorly beyond apex of connective 7
7. Connective Y-shaped, with arms widely diverging, each arm not much shorter than stem . . **A. virescens** (Metcalf) (fig. 254)
Connective linear or elongate Y-shaped, the stem very much longer than the arms 8
8. Aedeagal shaft short, nearly crescentiform, broadest at midlength in lateral aspect 9
Aedeagal shaft with none of the above characters 10
9. Aedeagal shaft bifid at apex.
A. flavoscutellata (Signoret) (fig. 255)
Aedeagal shaft not bifid at apex.
A. nigriceps (Signoret) (fig. 256)
10. Aedeagus with ventral margin concave basally 11
Aedeagus in lateral aspect with ventral margin convex in basal half 12
11. Aedeagus with ventral portion of atrium extended ventrally; plates extending as far posteriorly as pygofer apex.
A. gracilis (Osborn) (fig. 257)
Aedeagus with ventral portion of atrium not extended ventrally; plates not attaining posterior pygofer margin.
A. hastata (Walker)
12. Aedeagus biundulate and bifid in apical one-sixth.
A. flagellata, new species (p. 262)
Aedeagus not so 13
13. Aedeagus bifid in apical half of length.
A. terminalis, new species
Aedeagus bifid only at extreme tip.
A. flaveoloides, new species (p. 265)

Acrogonia terminalis, *new species*

FIGURE 259

Length of male 8.5 mm.; of female 10.0 mm. Head with median length of crown less than transocular width, without an M-shaped elevation bordering posterior margin, disc not strongly concave, antennal ledges in lateral aspect carinate dorsally, clypeus very slightly flattened medially, face not pubescent. Pronotum not punctate, with

diagonal rectilinear dorsopleural carinae. Forewing completely hyaline, veins elevated, surface not punctate, without supernumerary veins in clavus. Male with pygofer very strongly produced, posterior margin rounded or truncate; plates slender and elongate, fused at their bases; styles extending farther posteriorly than apex of connective, each without preapical lobe and acute at tip; connective elongate and slender, slightly expanded at each end, without a median keel; aedeagus very slender and elongate, curved gradually posterodorsally, shaft bifid in more than apical half, without other processes; anal tube without a ventral process or basal sclerites. Female abdominal sternum VII as in *A. izzardi*, new species. Color of anterior dorsum black with crown, anterior portion of pronotum, and all of scutellum maculate with yellow, remainder of pronotum maculate with yellowish blue; face yellow, margined with black dorsally.

Holotype male, Río Huallaga Valley, Huanuco, Peru, altitude 500 m., June 17, 1954 (F. L. Woytkowski), on indefinite loan to USNM from NCS; one topotypic female and one male, Tingo María, Peru, August (NCS); one male, Monzón Valley, Peru, November 10 (CAS); and one male from San Antonio, Bolivia.

P. terminalis, new species, is closely related to *A. flaveoloides*, new species, but differs in its much more deeply bifurcate aedeagal shaft and its lack of deep lobes on the male pygofer.

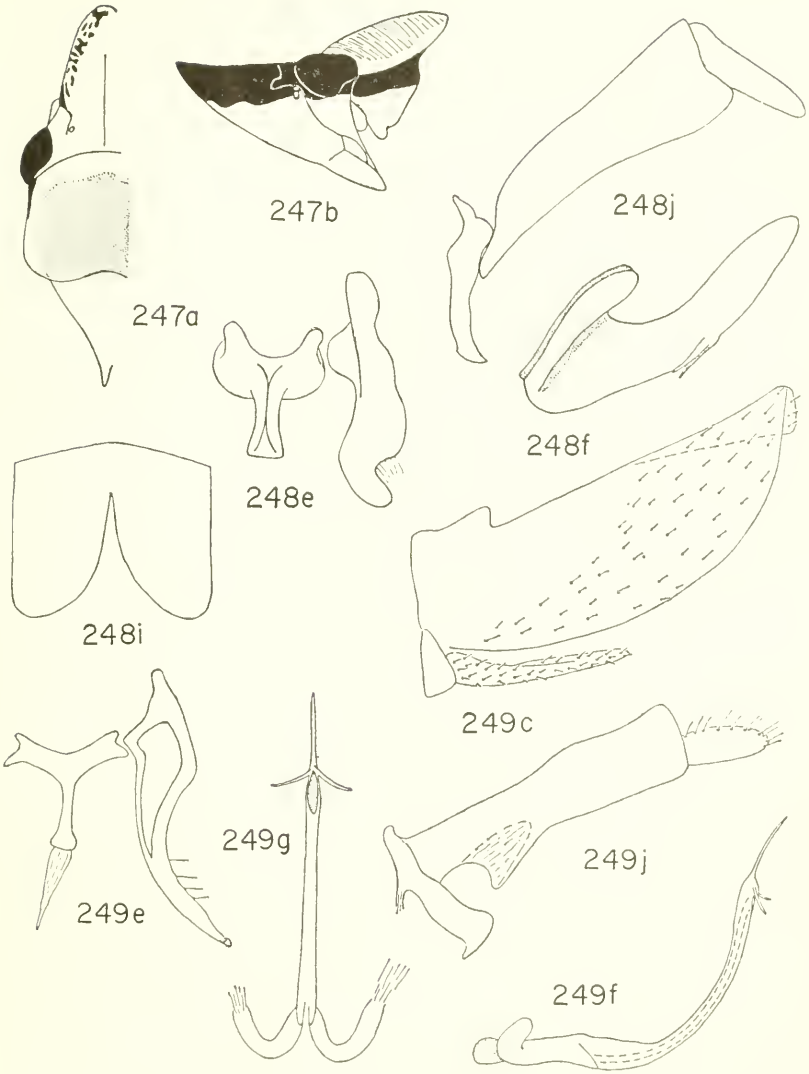
Acrogonia flagellata, *new species*

FIGURE 258

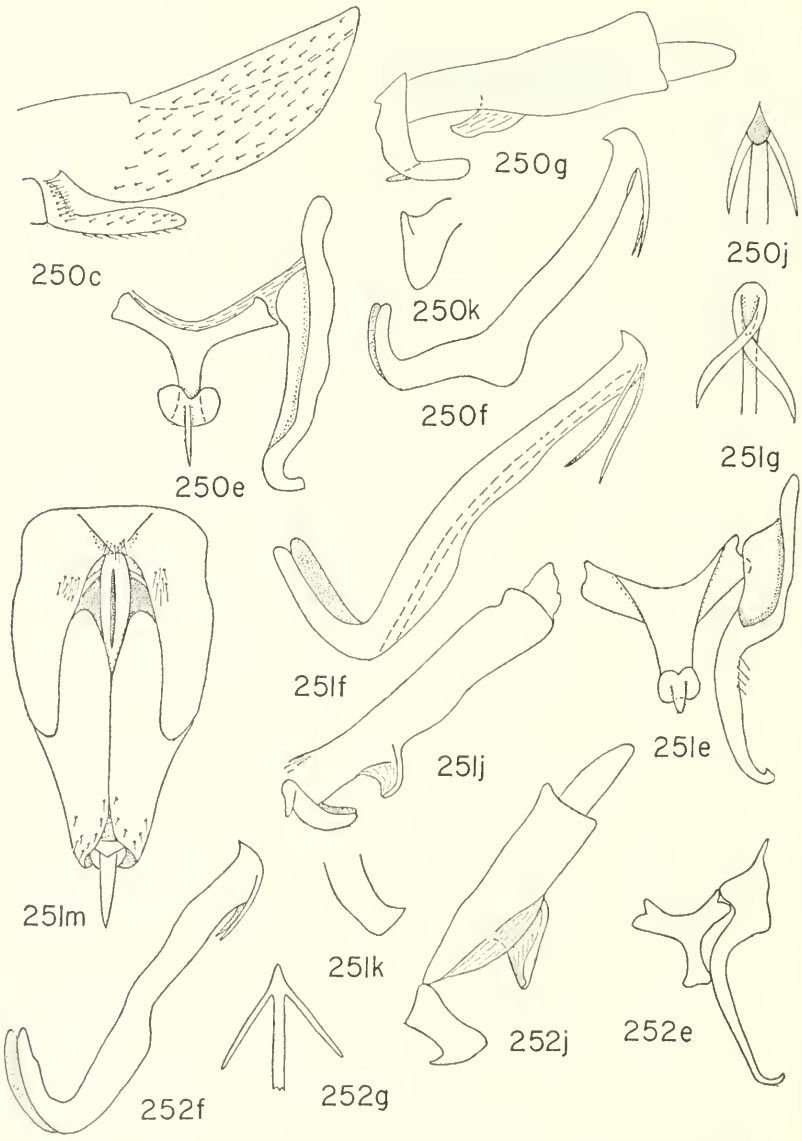
Length of male 9.5 mm. Head as in *A. terminalis*, new species, except that clypeus is convex medially. Forewing coriaceous with a membrane which includes all of apical cells. Male genitalia with pygofer strongly produced posteriorly, posterior margin convex; male plates as in *A. terminalis* but fused in basal half their length; aedeagus slender, very elongate, biundulate, bifid in apical one-sixth; anal tube with a basal sclerite which has a dorsal projection; other characters of male as in *A. terminalis*. Female unknown. Crown dull yellow with lateral margins black; pronotum with anterior and lateral margins concolorous with crown, disc dull gray; scutellum concolorous with crown; wings concolorous with disc of scutellum; face bright yellow, with a very broad basal black band.

Holotype male, labeled "Guyane/Kourou" on indefinite loan to USNM from NCS.

This species is very closely related to *A. terminalis*, new species, from which it differs in the characters mentioned in the description.



FIGURES 247–249.—**247,** *Acrogonia ignota,* new name, from lectotype of *A. lateralis* (Fabricius). **248,** *A. izzardi,* new species (**e, f, j** from holotype): **j,** anal tube and sclerite at base. **249,** *A. tridentata,* new species, specimen from Blancaflor, Bolivia.



FIGURES 250–252.—**250,** *Acrogonia obscurior* (Fowler), specimen from Tiquizate, Guatemala: **g,** anal tube and basal sclerite; **j,** aedeagal apex in caudal view; **k,** basal sclerite of anal tube in caudoventral view. **251,** *A. flammeicolor* (Fowler), specimens from Barro Colorado Island, Panama: **j,** anal tube and basal sclerite in lateral view; **k,** basal sclerite of anal tube in caudal view; **m,** apex of female abdomen, ventral view. **252,** *A. stylata,* new species, holotype: **j,** anal tube in lateral view.

Acrogonia flaveoloides, *new species*

FIGURE 260

Length of male 10.0 mm.; of female 11.5 mm. Head with median length of crown less than transocular width, without an M-shaped elevation bordering posterior margin, disc fairly concave in male, less so in female, antennal ledges in lateral aspect carinate dorsally, face convex medially. Pronotum as in *A. terminalis*, new species. Forewing of male with corium hyaline basally and apically, with a stigmalike costal spot before apical cells, of female coriaceous except for membrane, which includes all apical cells, in both sexes veins elevated and distinct, surface not punctate, without supernumerary veins in clavus. Male genitalia as in *A. terminalis* but with a sharply defined deep lobe on dorsal margin of pygofer and with aedeagus curved much more abruptly dorsad and bifid only at tip. Ground color of crown, anterior portion of pronotum, and scutellum black marked with yellowish orange spots, these larger on anterior pronotal margin, remainder of pronotum dull green with an orange yellow submarginal longitudinal stripe on each side in male; ground color of basal portion of forewings dull green; face as in *A. terminalis*.

Holotype male, Rio de Janeiro, October, C. F. Baker collection; and one female, same data (USNM).

This species is very closely related to *A. terminalis*, of which the distinguishing characters have been set forth in the discussion of that species (p. 261).

Acrogonia izzardi, *new species*

FIGURE 248

Length of male 10 mm.; of female 11.5 mm. Head with median length of crown less than transocular width, crown of male with a slightly elevated M-shaped area bordering posterior margin, disc not concave in male, concave in female, antennal ledges in lateral aspect carinate dorsally, clypeus flattened medially, face not pubescent. Pronotum punctate, dorsopleural carinae diagonally rectilinear. Forewing coriaceous with an apical membrane, veins elevated, surface not punctate, without supernumerary veins in clavus. Male with pygofer as in *A. obscurior* (Fowler); plates separate throughout their length; style extending farther posteriorly than apex of connective, with a distinct preapical lobe, apex rounded; connective short, Y-shaped, without a median keel; aedeagus with a pair of ventral retrorse processes near midlength; anal tube without a ventral process near midlength, with a basal sclerite which extends ventrally and with its apex directed slightly posteriorly. Female abdominal sternum VII broad,

conspicuous, with a median angular excision. Color fuscous tinged with dark green; face of male entirely yellow, of female yellow with a broad black margin above.

Holotype male, Upper New River, [British Guiana], c. 750 ft., Feb. 19–22, 1938 (C. A. Hudson), and one female from New River (BM).

This species is related to *A. obscurior* (Fowler) but differs chiefly in the location of the aedeagal processes, which are located near the midlength of the shaft in *A. izzardi*.

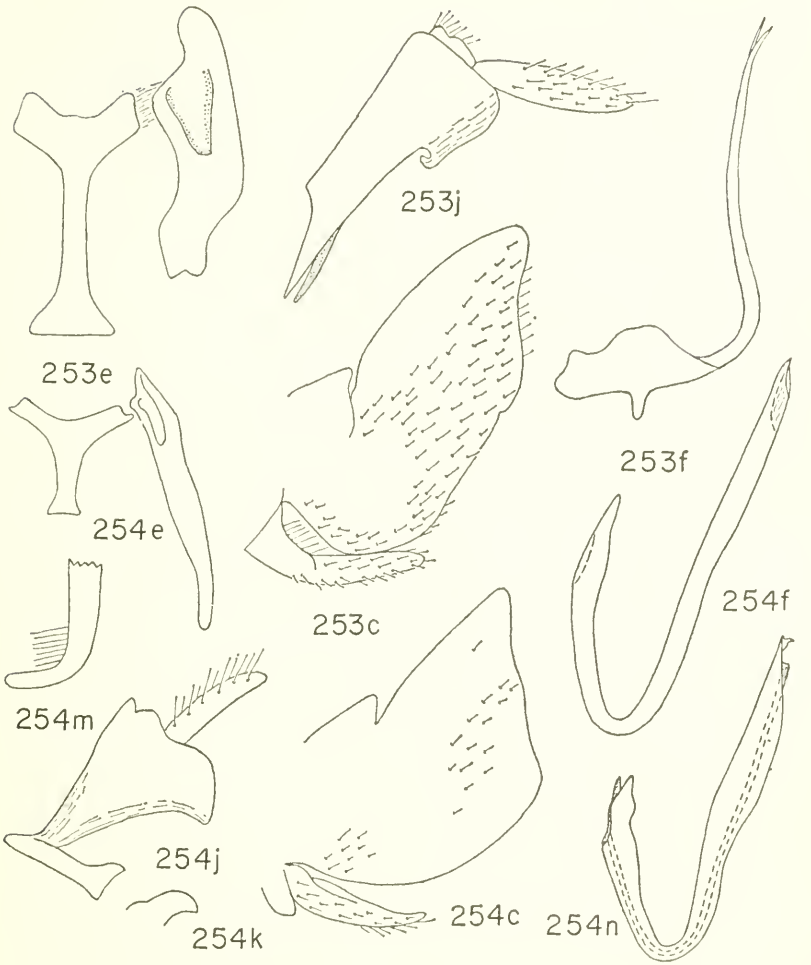
Acrogonia balloui, *new species*

FIGURE 253

Length of male 9.5 mm.; of female 11.5 mm. Head with median length about equal to transocular width in male, greater than transocular width in female, without an M-shaped elevation bordering posterior margin, disc of crown strongly concave, antennal ledges in lateral aspect carinate dorsally, clypeus flattened to slightly concave, face not pubescent. Pronotum not punctate, with diagonal rectilinear dorsopleural carinae. Forewing coriaceous, with apical membrane including all of apical cells, surface not punctate, without supernumerary veins in clavus. Male pygofer strongly produced, posterior margin slightly concave dorsally; male plates abruptly narrowed in basal third, thence gradually tapered to apices, not fused at their bases; styles not extending as far posteriorly as connective, truncate at apex; conective Y-shaped, with arms strongly divergent; aedeagus bifid at apex, with a short ventral protuberance near base; anal tube with a small ventral process in apical half. Ground color of crown dull brown, with a Y-shaped marking at apex and a pair of spots, one before each ocellus, black; pronotum with basal margin broadly concolorous with crown, disc sordid green, scutellum concolorous with crown, with a black line subtending each basal angle; forewing with coriaceous part dull green; face with a median longitudinal black marking extending from apex of clypellus dorsally nearly to apex of crown, antennal ledges and a line extending anteriorly from them, not reaching apex of head, black. In two teneral specimens at hand the deep green of the dorsum is replaced by a coppery hue.

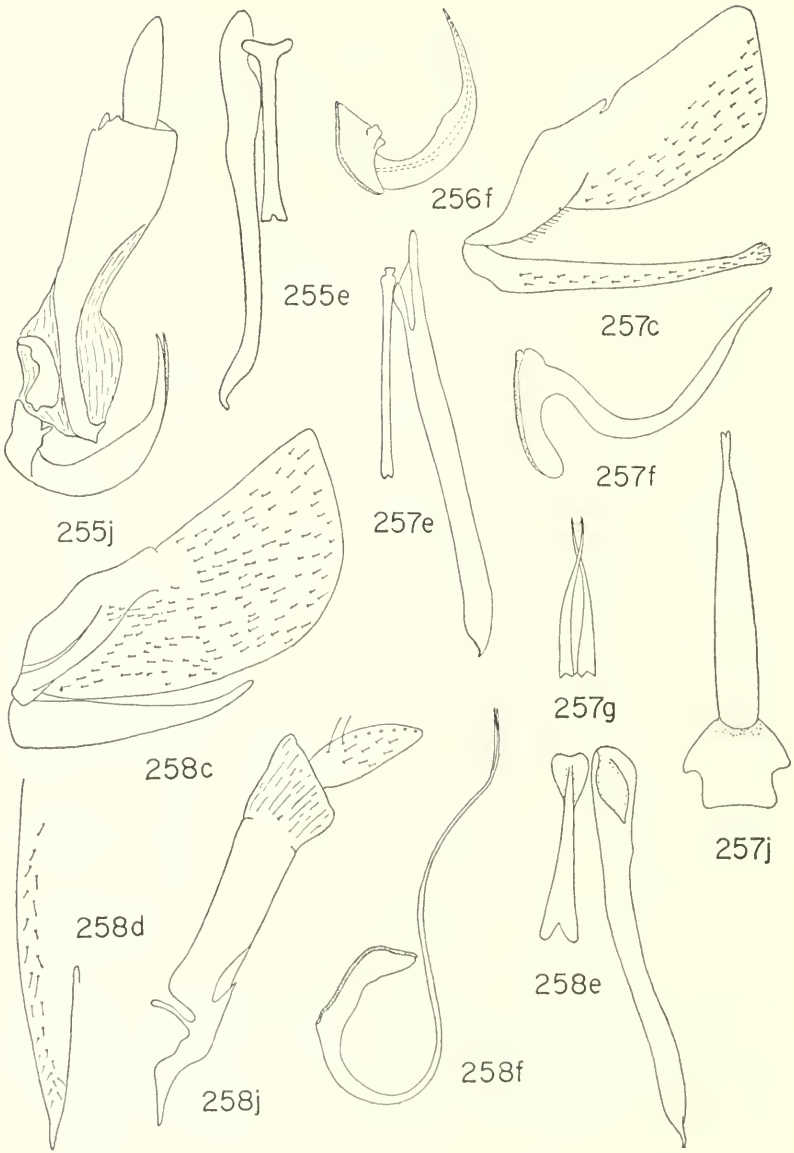
Holotype male, Caracas, Venezuela, Oct. 8, 1938 (C. H. Ballou), collected on *Allamanda cathartica* Linnaeus, and a pair of teneral specimens, same data (USNM); one male and two females, Trinidad Island, July, on *Croton* sp. (NCS).

This species is named in honor of the collector whose collections in the tropics of the New World have contributed much to the knowledge



FIGURES 253, 254.—**253,** *Acrogonia balloui*, new species, holotype: **j,** anal tube in lateral view. **254,** *A. virescens* (Metcalf) (**n,** from lectotype of *A. bicolor* (Fabricius); others, from specimen from "Chapada," Brazil): **j,** anal tube and basal sclerite in lateral view; **k,** basal sclerite of anal tube in ventral view; **m,** apical portion of style in lateral view; **n,** aedeagus in lateral view.

of the Neotropical fauna. *A. balloui*, new species, is quite different from all the other species in the genus in the peculiar form of the styles, the rather broad connective, and in the ventral protuberance near the base of the aedeagus.

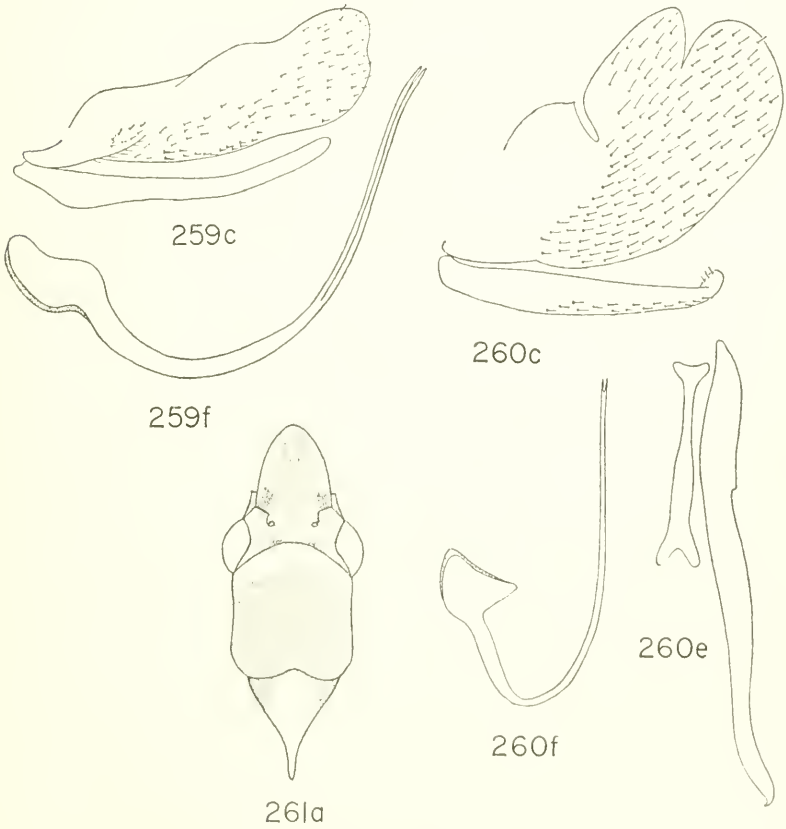


FIGURES 255–258.—**255,** *Acrogonia flavoscutellata* (Signoret), specimen from Palmira, Colombia: **j,** anal tube, laterotergite, and aedeagus, in lateral view. **256,** *A. nigriceps* (Signoret), specimen from Panama. **257,** *A. gracilis* (Osborn), from specimens from Panama. **258,** *A. flagellata*, new species, holotype: **j,** anal tube and basal sclerite in lateral view.

Acrogonia tridentata, *new species*

FIGURE 249

Length of male 12.5 mm. Head with median length of crown less than transocular width, without an M-shaped elevation bordering posterior margin, disc strongly concave, antennal ledges in lateral aspect carinate dorsally, clypeus very slightly flattened medially, face slightly pubescent below. Pronotum as in *A. terminalis*, new species. Forewings as in description of male of *A. flaveoloides*, new species. Male with pygofer very strongly produced; plates broad, short, triangular, truncate apically; styles extending farther posteriorly than apex of connective, each without preapical lobe, narrowed and sharply curved



FIGURES 259–261.—259, *Acrogonia terminalis*, new species, holotype. 260, *A. flaveoloides*, new species, holotype. 261, *A. sagittaria* (Walker), from the holotype of *A. olivacea* (Osborn).

apically; connective Y-shaped with arms widely divergent, each almost as long as stem; aedeagus curved gradually posterodorsally, with pair of lateral processes and a median apical process (lateral processes often longer than in fig. 249); anal tube with an unpaired median process in basal half and a pair of sclerites at base. Female unknown. Ground color of crown, anterior margin of pronotum, and scutellum, brown, each marked with black, the most conspicuous marking being an apical Y-shaped mark on crown; disc of pronotum dull greenish, minutely vermiculate with black; forewings hyaline except for a stigmalike anteapical costal spot and commissural margins of clavus, both of which are fuscous-greenish; face yellow, apex of clypellus and lower portion of clypeus broadly black, the clypeal marking with a median dorsal extension, with an incomplete marginal black line extending anteriorly from each eye.

Holotype male, Río Huallaga Valley, 500 m., Huanuco, Peru, Feb. 22, 1954 (F. L. Woytkowski), on indefinite loan to USNM from NCS; and four topotypes (NCS). Additional specimens have been studied from Río Tapiche, Peru; Blancaflor, Bolivia; and Itaituba, Brazil.

This species is closely related to *A. obscurior* (Fowler) and *A. flammeicolor* (Fowler), from both of which it can be distinguished by the shape of the aedeagal apex.

Acrogonia stylata, *new species*

FIGURE 252

Length of male 10.9 mm. Head with median length of crown approximately two-thirds transocular width, disc strongly concave, clypeus concave or convex dorsally, face pubescent below; other head characters as in *A. terminalis*, new species. Pronotum and forewing as in *A. terminalis*. Male with pygofer slightly concave on posterior margin; plates separate throughout their length, each abruptly narrowed in basal half, not elongate; styles extending much farther posteriorly than apex of connective, each without preapical lobe, curved and acute at apex; connective Y-shaped, with stem about equal in length to arms; aedeagal shaft nearly straight, dorsal margin acute at apex, with a pair of retrorse slender tapering apical processes that are gradually divergent from shaft in ventral aspect; anal tube with pronounced ventral process at approximately midlength and a pair of basal processes, each of which is curved anteriorly and acute at apex. Female unknown. Ground color of anterior dorsum dull green, with poorly delimited black area surrounding yellow markings at apex of crown, a pair of larger yellow spots between apex and ocelli, an area before each ocellus and bordering suture, a few areas on pronotum

behind each eye, scutellar basal angles, a median basal scutellar spot and scutellar apex, yellow; wing with veins and commissural margin to apex of clavus black, the pigment appearing irregular at edges of veins, with a dark-pigmented area of variable extent in area of anteapical cells; face black with apex and two lateral spots on genae one beneath each eye and smaller spots on thoracic pleura, yellow; legs yellow tinged with ferruginous.

Holotype male, Hacienda María, Cuzco, Peru, March 21, 1952 (F. L. Woytkowski), along Río Cosnipata, 900 m., on indefinite loan to USNM from NCS. One additional male from Callanga, Paucartambo Prov., Peru (NCS). *A. stylata*, new species, is closely related to *A. obscurior* (Fowler) and *A. flammeicolor* (Fowler), from both of which it may be distinguished by its much longer styles and the location of the ventral anal process which is more distal in *A. stylata* than in either of the other species.

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